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POCKET CYCLOPEDIA
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POCKET CYCLOPEDIA OF NURSING

*Richard
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PREFACE

The object of the present work is to provide in handy form a small reference volume, which a nurse, whether graduate or pupil, whether engaged in general or in special work, and whether at home or abroad, may have for quick reference on any subject connected with the practical side of her profession.

We take pleasure in presenting a number of original contributions, especially written for this work; and we herewith tender our heartiest thanks to those whose names are mentioned in the List of Contributors.

In addition, the following is a list of sources from which material has been taken:

Bailey, Harriet. "Nursing Mental Diseases."

Blumgarten, A. S. "Materia Medica for Nurses."

Colp, Ralph, and Keller, Manelva W. "Textbook of Surgical Nursing."

Harmer, Bertha. "Principles and Practice of Modern Nursing."

Harrison, Eveleen. "Home Nursing."

Henderson, Louise. "Practical Nursing."

Hill, H. W. "Sanitation for Public Health Nurses."

Jammé, Anna C. "Textbook of Nursing Procedures."

Kimber, Diana C., and Gray, Carolyn E. "Textbook of Anatomy and Physiology for Nurses."

Proudfit, F. T. "Dietetics for Nurses."

Smeeton, Mary A. "Bacteriology for Nurses."

Van Blarcom, Carolyn C. "Obstetrical Nursing."

By the use of a large number of cross-references, a general index has been rendered unnecessary. Catch words are placed at the top of each page, the first

PREFACE

title indicating the first topic on the left-hand page, and the second one the last topic on the right-hand page.

Our aim has been to present material written by Nurses and for Nurses.

R. J. E. SCOTT

POCKET CYCLOPEDIA
OF
NURSING

POCKET CYCLOPEDIA OF NURSING

A

ABDOMEN, REGIONS OF

The abdomen is artificially divided into nine regions, by four lines, two of which are drawn vertically, and two horizontally. There is no uniformity in the location of these lines, but the following may be recommended: The upper horizontal line is drawn at the level of the lowest point of the costal border; the lower horizontal line is drawn at the level of the anterior superior iliac spines; the vertical lines are drawn upwards from the center of Poupart's ligaments. The regions thus formed, and their contents, are indicated on the following page.

ABORTION

Synonyms.—Miscarriage, and Premature Labor.

The terms abortion and miscarriage refer to the interruption of pregnancy at any time previous to the attainment of viability by the fetus, *i.e.* before the sixth or six and a half months. Thereafter, until full time, the term premature labor is used. To the lay mind the word "abortion" suggests a criminal element, and the term miscarriage should be used in speaking to a patient or her friends.

A miscarriage is a miniature labor, and the later it occurs the more nearly does it resemble a full time labor. In all cases there are two stages recognizable—that of dilatation and that of expulsion. In late miscarriages and premature labors the third stage of separation of the placenta is also distinguishable.

ABORTION

The Abdominal Viscera Regionally Arranged.

RIGHT.	MIDDLE.	LEFT.
<p><i>Hypochondriac.</i> <i>Liver:</i> portion of. <i>Kidney:</i> upper and outer part. <i>Colon:</i> hepatic flexure and part of ascending colon.</p>	<p><i>Epigastric.</i> <i>Liver:</i> portion of. <i>Pancreas:</i> portion of. <i>Spleen:</i> portion of. <i>Kidneys:</i> portion of. <i>Suprarenal bodies.</i> <i>Stomach:</i> portion of. <i>Duodenum:</i> portion of. <i>Large intestine:</i> transverse colon, variable portion.</p>	<p><i>Hypochondriac.</i> <i>Liver:</i> portion of. <i>Spleen:</i> portion of. <i>Pancreas:</i> portion of. <i>Kidney:</i> portion of. <i>Stomach:</i> portion of. <i>Colon:</i> splenic flexure</p>
<p><i>Lumbar.</i> <i>Kidney:</i> portion of. <i>Ascending colon</i> and portion or whole of cecum. <i>Small intestine:</i> portion of.</p>	<p><i>Umbilical.</i> <i>Kidneys:</i> portion of, with ureters. <i>Duodenum:</i> portion of <i>Jejunum</i> and ileum. <i>Transverse colon:</i> portion of. <i>Sigmoid flexure</i> and commencement of rectum.</p>	<p><i>Lumbar.</i> <i>Kidney:</i> portion of. <i>Small intestine:</i> portion of. <i>Descending colon</i> and portion of sigmoid flexure.</p>
<p><i>Inguinal.</i> <i>Small intestine:</i> portion of. <i>Cecum:</i> lower portion, occasionally. <i>Inguinal canal.</i></p>	<p><i>Hypogastric.</i> <i>Small intestine:</i> portion of. <i>Sigmoid flexure</i> and rectum (portion). <i>Cecum:</i> occasionally. <i>Ureters:</i> portion of. <i>Bladder:</i> in children: and if distended, in adults. <i>Fundus uteri</i> and appendages.</p>	<p><i>Inguinal.</i> <i>Small intestine:</i> portion of. <i>Sigmoid flexure:</i> portion of. <i>Inguinal canal.</i></p>

Abortion is said to occur most frequently about the third month. This is because the decidua is extremely vascular in these early months, and the attachments of the ovum are still slender and not fully formed. It is most liable to occur at times corresponding to the suppressed menstrual periods, owing to the increased congestion and greater reflex irritability of the uterus at these times. It is more common in multiparæ than in primiparæ, especially in those who have had a rapid succession of pregnancies.

Etiology.—The contractions of the uterus, which lead to the premature separation of the ovum and its expulsion, may be excited in three ways: (1) By hemorrhage into the decidua; (2) by death of the embryo or fetus; (3) by conditions acting upon the uterine center in the spinal cord.

ABORTION

Predisposing Causes.—These are legion, and it is impossible to discuss them individually. A little consideration will show that they all lead to one or more of the three immediate causes mentioned above. Most of them tend either to the destruction of the fetal life, or to hemorrhage, by producing a congested decidua or affecting the health of the vessel walls. They may be classified as follows:—

1. *Paternal.*—Syphilis, and other toxic states.

2. *Maternal.*—

(a) *General:*

Toxic states—

Syphilis,	Fevers,
Tubercle,	Lead poisoning,
Toxemia of pregnancy,	Malaria, etc.

Diseases affecting the circulation—

Heart disease,	Kidney disease,
Liver disease,	Lung disease.

Ecbolic drugs. Excessive fatigue, or emotion.

(b) *Local:*

All causes of acute and chronic pelvic congestion—

Malformations of the uterus.

Displacements, especially retro-displacement.

Metritis.

Endometritis.

Salpingitis.

Tumors.

Trauma.

Sexual excess.

Criminal induction.

3. *Fetal.*—Anything leading to death of the fetus, as diseases or deformities of the fetus, placenta (especially low insertion, placenta prævia, and extensive infarction as often found in albuminuria), membranes, cord, or liquor amnii (e.g. hydramnios).

The relative frequency of all the predisposing causes of abortion is said to be—(1) Endometritis; (2) Retrodisplacement; (3) Syphilis; (4) Toxemia of pregnancy; (5) Criminal induction; (6) Low insertion of the placenta.

Symptoms and Signs.—These are four in number:—

(1) *Hemorrhage.*—This is usually the first to appear. It begins as a slight discharge in most cases, and becomes more profuse as the abortion proceeds. After the uterus has expelled its contents the bleeding ceases.

(2) *Pains.*—These are miniature labor pains in typical cases—situated in the small of the back and passing round

ABORTION

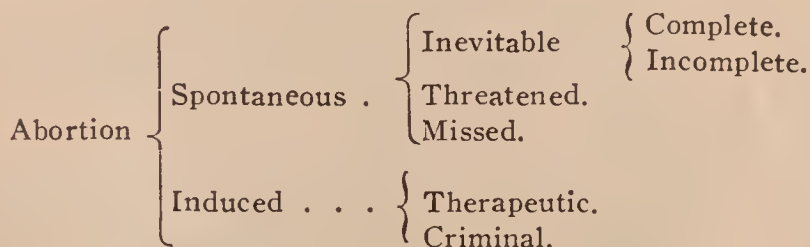
to the front, and being intermittent in character. They begin gently and become progressively more severe until the abortion has been accomplished.

(3) *Dilatation of the os uteri* usually follows the onset of pains, but in some cases the os may be found open on examination immediately after the pain has begun. When the uterine contents have been entirely expelled the os closes again just as after labor.

(4) *Protrusion and Expulsion of the Contents of the Uterus*.—When this occurs there remains no possibility of averting the abortion. Occasionally the ovum remains for some time in the cervical canal, the uterine contractions being too feeble to expel it completely.

Diagnosis.—The first point to determine is whether the patient is pregnant. This may be done by the history and the signs and symptoms of early pregnancy. Abortion is then diagnosed by the presence of the above symptoms—pain, bleeding, dilatation of the os, and possibly protrusion of the ovum.

Varieties.—Abortions have been arranged in different varieties from more than one point of view. From the etiological point of view they fall into two groups, *Spontaneous* and *Induced*, and the latter may be further subdivided into *Therapeutic* and *Criminal*. From the clinical point of view abortions are regarded as *Threatened* (where it seems possible to stop the process by appropriate treatment) and *Inevitable* (where the process cannot be stopped). When the abortion proceeds it falls either into the category of *Complete* abortions, if the uterus empties itself entirely, or of *Incomplete* abortions, if portions of the products of gestation are retained. A last variety is what is called *Missed* abortion. These may be represented in a scheme as follows:—



Threatened Abortion may be diagnosed when the symptoms are not severe—when the bleeding is not excessive, the pains infrequent and not severe. The best rule, indeed, is to regard every abortion as threatened until it can be definitely shown to be inevitable.

Inevitable Abortion.—Free bleeding and frequent and severe pains make it unlikely that the abortion will be

ABORTION

averted, but the only thing which can be definitely regarded as proving it to be inevitable is either the escape of the liquor amnii, or the protrusion of the ovum through the external os indicating a considerable separation of the ovum.

Complete Abortion.—Where the fetus with its membranes and the decidua has been expelled entire, as often happens in the first ten weeks, the abortion is *Complete*, and the signs and symptoms promptly subside, while the involution of the uterus proceeds just as after labor. Inspection of what has come away is the best means of diagnosing a complete abortion. Failing that the diagnosis must rest on the cessation of the symptoms, the closure of the os, and the subsequent disappearance of all signs of pregnancy.

Incomplete Abortion is specially common from the tenth to the twentieth week owing to the firm attachment of the placenta. In these cases the membranes rupture and the fetus escapes, but the placenta remains with at least portions of the membranes and decidua. The pains frequently cease after the fetus is cast off, but the bleeding tends to go on, and the os remains patent. If the remaining contents are not either expelled spontaneously or removed within a few days, they are apt to decompose, and the discharge becomes offensive. The patient develops sapremia, and the conditions are the same as a puerperal sapremia.

After the contents are removed the discharge soon ceases, and the os closes.

Missed Abortion.—This term is applied to cases in which the symptoms of abortion come on, but subside without anything having been expelled. This may recur once or twice, and ultimately after months the contents of the uterus are expelled in a state which shows that the fetus died at the time of the first onset of symptoms. If this first onset of symptoms occurs after the placenta is developed, the fetus and placenta are usually in a macerated condition, but sometimes they are dried and mummified.

In all cases of abortion it is most important to instruct the attendant or the patient to keep everything that is passed from the vagina. This is rarely done without specific instructions, and the diagnosis often hangs upon it.

Treatment

Prophylaxis.—This is of the greatest importance. It implies not merely the treatment of threatened abortions, but also that, when an abortion has taken place, the cause should be ascertained and treated, so that a subsequent pregnancy may not be similarly interrupted. Displacements of the uterus must be rectified, endometritis cured, syphilis treated, and so forth. During the next gestation particular

ABOULIA

care should be observed, especially at times corresponding to suppressed menstrual periods, and all causes of pelvic congestion avoided.

Treatment of Threatened Abortion resolves itself into absolute rest and the administration of sedatives—of which by far the most effective is opium in some form. The patient should be put to bed at once, and remain there with her head low, not seeing any visitors. A hypodermic injection of morphine may be given to bring the uterus rapidly under the influence of the sedative, and smaller doses of opium given by the mouth at intervals. Only the lightest and most digestible nourishment should be given, and very hot drinks should be avoided. If the bowels are loaded, they should be gently moved by an oil enema, or some mild laxative. This treatment should be maintained until the symptoms subside, and the patient should remain quietly in bed for a week after the bleeding has stopped, or preferably until the time that would correspond to the next menstrual period has passed. If the cause of the abortion is a retro-displacement, it should be rectified. The patient should be warned not to indulge in freedom of exercise, and to avoid sexual intercourse, as hemorrhage is apt to recur.

Treatment of Inevitable Abortion.—The active treatment of an ordinary case of inevitable abortion is—*nil*. If it be left alone, Nature will complete it without the risks always associated with interference. Interference is called for, (1) if the hemorrhage is so severe as to endanger the patient's life; (2) if the ovum be actually protruding through the os; (3) if slight bleeding has been going on for weeks, and the patient is becoming ill; (4) if the abortion has been proved to be incomplete by inspection of what was expelled; (5) if constitutional symptoms appear, due to loss of blood or sapremia.

Premature Labor.—The treatment of miscarriages in the sixth month, and of premature labor, differs in no essential from the management of an ordinary labor.

ABOULIA

Aboulia is shown by hesitation and indecision. Even when a strong stimulus is applied, some real incentive for action given, no response takes place. A person may be unable to dress because he cannot decide which arm should first be put into its sleeve, or whether the stocking should be first drawn on to the right or the left foot. The same difficulty arises whenever a choice or a decision, however trivial or important, has to be made. The power to determine action (volition) is so lacking or diminished that the

ACCOMMODATION

patient is unable to make decision, and it usually has to be made for him by the nurse or some other person.

ABRASIONS

See WOUNDS.

ABSCESS

An **abscess** is a circumscribed collection of pus in a newly formed cavity. There are the usual signs of an inflammation—pain, swelling, redness and heat; if the abscess is large, fluctuation may be detected. The treatment is surgical; the abscess should be opened, and drained. Antiseptic dressings are then applied till the abscess is healed.

Special abscesses are retropharyngeal, peritonsillar, mammary and ischiorectal.

ACCOMMODATION

Accommodation is the ability of the eye to adjust itself so that it can see objects at varying distances. The theory most generally accepted is that the ciliary muscle is the active agent in accommodation. When the eye is at rest or fixed upon distant objects the suspensory ligament exerts a tension upon the lens which keeps it flattened, particularly the anterior surface to which it is attached. When the eye becomes fixed on near objects, as in reading, sewing, etc., the ciliary muscle contracts and draws forward the choroid coat, which in turn releases the tension of the suspensory ligament upon the lens, and allows the anterior surface to become more convex. The accommodation for near objects is an active condition and is always more or less fatiguing. On the contrary, the accommodation for distant objects is a passive condition, in consequence of which the eye rests for an indefinite time upon remote objects without fatigue.

Common Conditions that Affect Accommodation.—The conditions that affect accommodation are: (1) hypermetropia, (2) myopia, (3) presbyopia, and (4) astigmatism.

Hypermetropia or far-sightedness is a condition in which rays of light from near objects do not converge soon enough and are brought to a focus behind the retina. This is usually caused by a flattened condition of the lens or cornea, or an eyeball that is too shallow, and convex lenses are used to concentrate and focus the rays more quickly.

Myopia or near-sightedness is a condition in which rays of light converge too soon, and are brought to a focus before

ACCOMMODATION

reaching the retina. This is the opposite of hypermetropia and is caused by a cornea or lens that is too convex, or an eyeball of too great depth. To remedy this condition concave lenses are worn to disperse the rays and prevent their being focussed too soon.

Presbyopia is a defective condition of accommodation in which distant objects are seen distinctly, but near objects are indistinct. This is a physiological process which affects every eye sooner or later, and is not due to disease. It is said to be caused by a loss of elasticity of the lens.

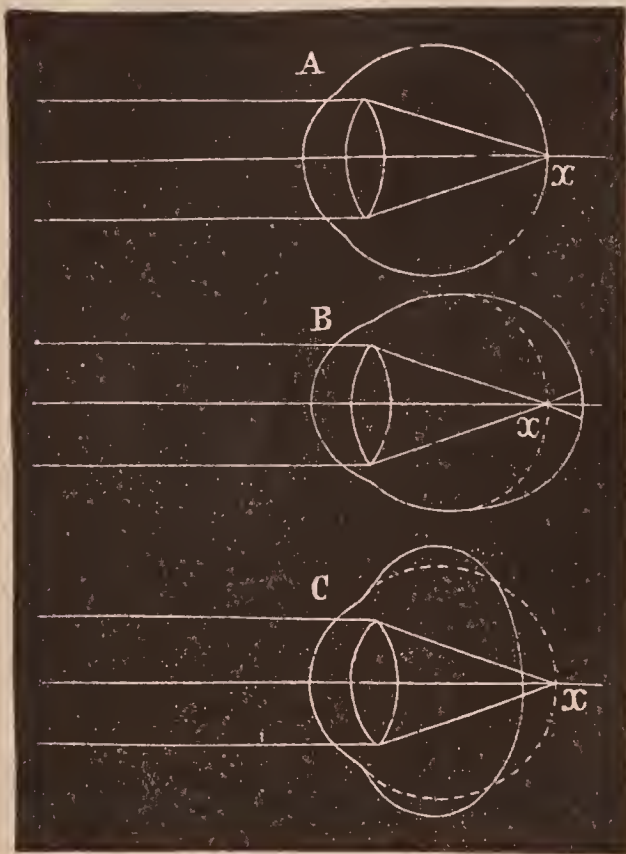


Diagram illustrating rays of light converging in (A) a normal eye, (B) a myopic eye, and (C) a hypermetropic eye.

Astigmatism is the condition in which the curvature of the cornea or lens is defective. An excess of curvature in the long axis of the cornea, as compared with that of its horizontal axis, is the more common defect. Glasses with curvatures the opposite of those of the eyes are used to correct this defect.

When hypermetropia, myopia, presbyopia, or astigmatism is present, the condition is said to be one of *Ametropia*.

ACETIC ACID

A. C. E. MIXTURE

See ANESTHETICS.

ACETANILID (ANTIFEBRIN)

Acetanilid is a white crystalline powder formed by the action of glacial acetic acid, on aniline, a chemical substance which is an ingredient of many dyes. It is not readily dissolved in water. The dose is 1 to 10 grains.

Compound Acetanilid Powder consists of 7 parts of acetanilid, 1 part of caffeine and 2 parts of sodium bicarbonate. Dose, 8 grains.

See ANTIPYRETICS.

ACETIC ACID, DILUTE

Acetic acid is an organic acid formed by the prolonged fermentation of various fruits and vegetables.

Local Action.—Dilute acetic acid hardens and cools the skin; it contracts the mucous membranes; it checks bleeding by contracting the blood vessels. Concentrated solutions when locally applied, cause redness, pain, and the formation of a blister with slight destruction of the skin.

Internal Action.—It increases the flow of saliva, thereby lessening thirst; it increases the secretion of gastric juice, improves the appetite, and aids digestion; it increases the secretions, but it is readily neutralized by the alkaline intestinal juices.

Poisonous Effects

The symptoms of poisoning by large doses of acetic acid, are similar to those caused by the mineral acids, but they are rarely fatal. The treatment is the same.

Chronic Poisoning

Continued use of acetic acid often causes emaciation, loss of weight, and anemia.

Preparations

Vinegar (not official).—Vinegar is obtained by prolonged fermentation of alcoholic liquors. The best vinegar is made from cider, and consists mostly of acetic acid.

Dilute Acetic Acid.—This is a pure form of vinegar which contains 6 per cent. of acetic acid. Dose, half a dram to two drams.

These preparations are used principally to harden the skin, to check bleeding, and, by inhalation, to relieve fainting. They are also used to neutralize poisoning from alkalies.

ACETONE

For Local Use

Glacial Acetic Acid.—This contains 99 per cent. of acetic acid.

Trichloroacetic Acid.—This is a crystalline substance.

These two latter preparations are used principally to remove warts and to cauterize or destroy tissues.

ACETONE

Test for Acetone.—Pour 5 c.c. of urine to be tested into a test tube, add a crystal of sodium nitroprusside, acidify with glacial acetic acid, shake well, and then make alkaline with ammonium hydrate. The presence of acetone is indicated by a purple color.

Acetone Bodies.—Diacetic acid, oxybutyric acid, and acetone develop in diabetes as a result of the breaking down of the fats and the lack of certain neutralizing agents found chiefly in carbohydrate foods. They are often the precursors of diabetic coma.

See DIABETES MELLITUS.

ACETPHENETIDIN (PHENACETIN)

Acetphenetidin or Phenacetin is a white crystalline powder made from coal tar. The dose is five to fifteen grains.

And see ANTIPYRETICS.

ACIDOSIS

Acidosis is a form of intoxication due to the retention in the body of the acetone bodies. It is found in diabetes and other conditions, and usually precedes coma; it is generally fatal.

See ACETONE BODIES, and DIABETES MELLITUS.

ACIDS, INORGANIC OR MINERAL

The mineral acids principally used in medicine are hydrochloric, sulphuric, nitric, nitrohydrochloric, and phosphoric acids. They are used principally to replace acid in the stomach when its secretion is diminished. The organic acids produce practically the same effects as the inorganic acids with only slight individual differences.

Local Action: Applied to the skin, or mucous membranes, concentrated solutions of acids are very injurious to the tissues, and destroy the skin, mucous membranes and underlying tissues.

The tissues become shrunken, hard and brittle, because the acids withdraw water from the tissues with which they come in contact.

ACIDS, POISONING BY

Dilute solutions of the acids usually contract mucous membranes.

Internal Action.—In the mouth: The dilute solutions ordinarily used have a characteristic sour taste and relieve thirst. They increase the flow of saliva and contract the mucous membrane of the mouth.

In the stomach: The acids aid the digestion of protein or albuminous food, since the pepsin acts only in the presence of an acid, particularly hydrochloric acid.

In the intestines: If the acid enters the intestines, it is immediately neutralized by the alkaline juices which are always present there. Salts are thus formed, and at the same time the pylorus of the stomach immediately closes, to prevent more acid from entering the intestines.

The acids are rapidly absorbed into the blood from the stomach, in combination with proteins or as salts formed with the alkalies of the tissues. They then produce no effects, except to make the blood somewhat less alkaline in reaction. As a rule, the alkalinity of the blood is not greatly influenced by acids.

Excretion

The acids are eliminated from the body by the urine, as acid salts; the alkalies of the salts being kept back in the blood. The urine is therefore more acid in character, and often slightly injures the kidneys, when the urine may contain albumin or blood. The patient may also have burning pain in the bladder when passing urine.

Administration

All the acids should be given before or with meals, well diluted, sipped very slowly through a glass tube, so as not to injure the teeth. Diarrhea and griping pains in the abdomen are symptoms of excessive action.

ACIDS, POISONING BY

Acute acid poisoning usually results from an acid taken with suicidal intent. The poisonous effects of all the acids are the same; except that hydrochloric and nitric acids make the tissues yellow and hard, while sulphuric acid turns the tissues white in color and then brown.

Symptoms

1. **Severe burning pain in the mouth, throat and stomach.** The tissues about the mouth become dry, shrunken, white or yellow in color.

ACONITE

2. **Profuse vomiting.** The vomited matter contains blood and pieces of mucous membrane.

3. **Profuse diarrhea.** The stools contain blood and pieces of mucous membrane.

As a result of the destruction of the mucous membrane of the stomach and intestines, the patient suffers from:

4. **Profound collapse** (rapid, thready, weak pulse, slow, shallow breathing, subnormal temperature). Death usually occurs in several hours.

Frequently, as a result of lessened alkaline salts in the blood, there occurs:

5. Difficult breathing.

6. Twitchings of the muscles or convulsions.

Occasionally the fumes of the acid may cause swelling of the larynx (edema of the glottis), and the patient may then die of asphyxia.

If the patient recovers, he may suffer from various symptoms produced by the narrowing (stenosis) of the esophagus, because of the scar tissue formed by the healing of the wound.

Treatment

1. Neutralize the acid with an alkali; such as **magnesia, or magnesium carbonate, sodium bicarbonate, or lime water.**

Sodium bicarbonate should be used cautiously as it may form carbon dioxide gas and distend the stomach.

If these substances cannot be obtained, soap suds may be used. Giving plenty of water helps to dilute the acid. The stomach may be washed out, *but with great care*, as the stomach tube may pass through the injured stomach wall.

2. Protect the mucous membranes of the esophagus and stomach by white of egg, milk, flour and water, etc.

3. Keep the patient quiet.

4. The collapse is treated with heart stimulants, such as caffeine, strychnine, atropine, etc.

5. Sodium bicarbonate solutions are given intravenously or per rectum, to increase the alkaline salts in the blood.

ACONITE

Aconite is obtained from the root of **Aconitum napellus**. The root often resembles horse-radish in appearance. The active principle of aconite is the alkaloid, **aconitine**.

Appearance of the Patient.—When an average dose of aconite is given, the patient's mouth and throat feel warm, and he often complains of slight numbness and tingling of the lips, tongue and throat, or even in the extremities. The

ACONITE

pulse is slower and somewhat weaker, and the breathing is usually slow and shallow. The temperature is lower and the patient often feels quite weak.

Action in the mouth: Aconite has a bitter taste and causes a prickling and tingling sensation followed by numbness in the mouth and throat. This effect on the nerve endings in the mouth, causes a reflex flow of saliva. Later the secretions are checked and the mouth feels dry.

In the stomach and intestines: In the doses that aconite is usually given, it produces no effect. In larger doses, however, it often causes nausea and vomiting.

Action after Absorption. On the heart: Aconite makes the heart beat slower and weaker, and lessens the blood pressure.

The pulse of aconite is usually slow, weak, soft and compressible.

On the respiration: Moderate doses of aconite increase the breathing, but large doses make the breathing slower and labored.

On the nerve endings: When taken internally, or when applied locally, aconite makes the sensory nerve endings of the skin and mucous membranes more sensitive at first, and later paralyzes them. This produces the tingling and prickling sensations, followed by numbness, which are so characteristic of aconite.

The muscular weakness produced by aconite in large doses, is due to its effect on the nerve endings in the muscles.

On the secretory glands: Aconite increases the secretion of sweat and saliva.

Effect on temperature: It reduces temperature by increasing the elimination of heat.

Poisonous Effects

Since aconite is rapidly excreted, only acute aconite poisoning occurs, usually from the administration of an overdose.

Aconite is one of the few poisons which cause death very rapidly. If a sufficiently large dose is taken, the patient may die immediately, from sudden paralysis of the heart. Usually, however, the symptoms appear very rapidly and the patient dies in about three or four hours.

Symptoms.—The first, and diagnostic symptom of aconite poisoning is:

The characteristic tingling and prickling sensation on the lips, mouth and throat, and a smarting, tingling feeling of the skin of the extremities, soon followed by numbness. Later this sensation passes over the entire body.

ACROMEGALY

2. Profuse flow of saliva.
3. Nausea and vomiting.
4. Great muscular weakness.
5. Slow, irregular, weak pulse.
6. Slow, shallow, difficult, irregular breathing.
7. Collapse (cold, moist skin; anxious face; protruding eyeballs with dilated pupils; rapid, thready, very weak pulse).
8. Often there are convulsions and unconsciousness just before death. Usually, however, consciousness remains to the last. Death usually results from paralysis of the respiration.

Treatment.—To save a patient from aconite poisoning, quick action is necessary, as death results very rapidly.

1. Wash out the stomach.
2. **Atropine is given as an antidote.**

This prevents the slow weak heart action, by paralyzing the nerve endings in the heart, of the vagus nerve, and it also makes the breathing faster and deeper.

3. Keep the patient absolutely quiet, flat on his back, lower the head by removing the pillows, and elevate the foot of the bed.

4. Give artificial respiration.

5. Heart stimulants such as caffeine, whiskey, ammonia, are usually given.

Uses

Aconite is now rarely used. It is principally given to reduce fever in acute infectious diseases.

Preparations

Fluidextract of Aconite; dose one to two minims.

Tincture of Aconite; dose one to five minims.

This is the preparation commonly used.

Aconitine; dose $\frac{1}{400}$ to $\frac{1}{100}$ of a grain.

For Local Use

Aconite Liniment and Aconite Ointment each contains about 2 per cent. of aconite.

ACROMEGALY

See PITUITARY GLAND, DISEASES OF.

ADALIN

Adalin is an organic bromide salt. It produces the same effects as the other bromides. It is used as a hypnotic, in doses of five to ten grains.

ADHESIVE STRAPPING

ADENOIDS

Adenoids are hypertrophied tissue in the nasopharynx. This hypertrophy is apt to produce mouth-breathing, a vacant expression, impairment of hearing, a muffled voice; enlarged tonsils are often associated with adenoids. The treatment consists in removal, either with a curette or an adenotome. This operation requires no special treatment beyond that mentioned for tonsillectomy.

See PHARYNX, and TONSILLECTOMY.

ADHERENT PLACENTA

See RETAINED PLACENTA.

ADHESIVE STRAPPING

Adhesive plaster is used extensively in surgery to hold dressings and splints in place, to afford support and uniform pressure and to immobilize the part so as to secure rest and freedom from pain in diseases of the joints and in strains, sprains or fractures. It is applied most frequently to the chest, back, knee, ankle, wrist or elbow joint.

Adhesive plaster is made of rubber, petroleum and either lead acetate or zinc oxide spread on linen. It is applied directly to the skin. The warmth of the body is usually sufficient to make it adhere; if not, the adhesive may first be flamed over a lamp.

Before applying plaster to the skin, the part must be clean and dry and, if necessary, shaved to avoid irritation and pain on removal. The part to which the strapping is applied must first be placed in the proper position and maintained in this position throughout the procedure. The strips must be applied so that the pressure and support will be supplied where needed the most. In applying plaster care must be taken to make it fit the surface smoothly, without wrinkles; snipping the margin at intervals will help to accomplish this result. If necessary to apply adhesive over bony prominences, such parts should be protected. It should never be applied tightly enough over fleshy parts to cause its edges to cut into the tissue. When ascending strips are applied to a fleshy part gradually increasing in circumference care must be taken to avoid too much traction on the upper edge of the strap. Adhesive should be removed when soiled, curling or peeling at the edges. Adherent portions should be removed with benzine or ether. After the removal of adhesive the part should be washed with soap and warm water, dried thoroughly and powdered with talcum powder.

ADMINISTRATION OF MEDICINES

Drug	Time of Administration	Character and Quantity of Fluid	Method of Administration
Acids: Dilute hydrochloric Dilute sulphuric Dilute nitric, etc.	Before or with meals.	In tumblerful of water.	{ Sipped through a glass tube or straw.
Alkalies: Sodium bicarbonate Lime water Calcium salts, etc.	For effect in stomach <i>after meals</i> . For general effects <i>before or between meals</i> .	In half wineglassful of milk. In glass of water.	
Inorganic Salts: Sodium sulphate Sodium phosphate Potassium sulphate Potassium and sodium tartrate (Rochelle salt) Magnesium sulphate Carlsbad water Magnesium citrate Seidlitz powder..... Potassium bitartrate Potassium } Acetate Sodium } Potassium } Citrate Sodium } Iodides Nitroglycerin, ni- trites, etc.	In the morning on an empty stomach After meals.....	<i>To lessen edema,</i> in wineglassful of water. <i>For cathartic or diuretic effect</i> in glass (or more) of water. In glassful of milk flavored with a little sarsaparilla, wine or cinnamon water.	{ Dissolve each <i>Seidlitz Powder</i> in $\frac{1}{3}$ to $\frac{1}{2}$ glass of water and mix the two together. { Iron preparations should be sipped through a glass tube or straw. { For X Ray pictures, in glass of milk or as porridge.
Metallic Salts: Mercury Iron Arsenic Silver Zinc, etc. Bismuth salts Barium	{ Salts { used as astringents { For <i>absorption</i> after meals..... For <i>local</i> effect between meals.	In glass of milk. In small quantity of milk.	{ Iron preparations should be sipped through a glass tube or straw. { For X Ray pictures, in glass of milk or as porridge.
Alkaloid Salts: Morphine Atropine Strychnine, etc. Quinine	{ salts { After meals. As bitter, before meals. As bitter, before meals, undiluted.	In wineglassful of water slightly flavored. In wineglassful of sherry wine.	

ADMINISTRATION OF MEDICINES

Drug	Time of Administration	Character and Quantity of Fluid	Method of Administration
Glucosides: Digalen Strophantin Ouabain Digitalis Preparations	Between meals.	In glass of water slightly flavored.	
Galenicals: Extracts Infusions Fluid extracts Tinctures, etc. Bitters	Before meals.	Well diluted in a large glass of water. Undiluted and unflavored.	
Hypnotics: Chloral Trional Tetronal Veronal Sulphonal Paraldehyde, etc.	15 minutes before bed-time. $\frac{1}{2}$ to 2 hours before bed-time. 2 to 3 hours before bed-time.	{ In glass of warm milk or in beer. { Milk should be well diluted with water.	{ May be given per rectum in two ounces of boiled starch solution, injected with a glass syringe through a catheter.
Coal Tar and Synthetic Drugs: Phenacetin Acetanilid Antipyrin Pyramidon Salicylates Aspirin, etc.	Between meals.	In wineglass of wine or milk.	
Oils: Olive oil Cod liver oil Castor oil Croton oil	1 or 2 hours after meals.	{ In wineglassful of brandy, wine or lemon juice or as emulsion. { One or two drops dissolved in glycerin, olive oil, or butter, or on a piece of bread or sugar.	{ To unconscious or insane patients. { Placed on back of tongue with a spoon.
Hydrocarbons: Liquid petrolatum (Mineral oil) Liquid vaseline Albolene Russian mineral oil, etc.		Add just a little peppermint, raspberry juice or cinnamon water to flavor.	

ADRENALIN

ADRENALIN

See EPINEPHRIN.

AFFUSION

The affusion, like the douche, is a stream of water directed against the body. Unlike the douche, it has little mechanical effect and is applied to a larger area of the body. It may be a local or general application, the water being poured over the part from a pitcher or a pail.

The Effects of the Affusion.—The usual thermal and circulatory reactions follow according to the temperature used.

The *treatment is used* as a therapeutic measure in syncope, collapse, or shock, in asphyxia, in fevers and in hypostatic congestion. In private practice it is sometimes used instead of the douche.

It is *contraindicated* in typhoid fever with complications, in hemorrhagic cases, and in patients with a decompensating heart.

AFRIDOL

Afridol is a compound of mercury used to disinfect the hands, as a surgical antiseptic, and for various skin diseases. It usually comes in the form of a soap containing about 4 per cent. of the drug.

AFTER-BIRTH

This is the popular name for the placenta, umbilical cord, and membranes, expelled from the uterus after the birth of the fetus; it is often referred to as the "*secundines*."

AFTER-PAINS

After-pains are painful and intermittent contractions, occurring in the uterus of multiparous women for a few days after childbirth. They are due to efforts on the part of the uterus to expel portions of blood clots, or membrane; they are increased by the stimulation of the breasts in suckling, and they are very seldom found in primiparæ. As a rule relief is afforded by the administration of one dram of the camphorated tincture of opium with half a dram of the fluid extract of ergot! this may be required every two or three hours. When this fails a hypodermic of morphine sulphate ($\frac{1}{8}$ to $\frac{1}{4}$ grain) may be needed.

AGARICUS AND AGARICIN

Agaricus is a fungus, the **white agaric**, or *Agaricus albus* or *Boletus laricis*, which grows on the European larch tree. Its active principle is an acid, **agaric acid**, or **agaricin**, which is the preparation principally used.

ALCOHOL

Agaricin checks the secretion of sweat, by paralyzing the nerve endings in the sweat glands which cause secretion. The effect, however, is not as marked as that of atropine. Secretions of the other secretory glands are not affected by agaricin. It often causes nausea and frequent movements of the bowels. It does not affect the heart, respiration or pupils. It is used principally to check the night sweats of tuberculosis. It should be given about four or five hours before the expected sweat.

Agaricin is best given in pill form about five or six hours before retiring, as it is very slowly absorbed; dose $\frac{1}{12}$ to 1 grain.

Agaric Acid is a very poisonous substance; dose $\frac{1}{4}$ to $\frac{1}{2}$ of a grain. Overdoses cause vomiting, diarrhea and collapse.

AGURIN

See THEOBROMINE.

AIROL

See BISMUTH.

ALBUMEN, TEST FOR

See URINE.

ALCOHOL

Alcohol is a colorless fluid which evaporates very quickly. It has a pungent odor, and a burning taste. It burns very easily with a blue flame, and it is often used for heating purposes.

Alcohol is formed by the growth of the yeast plant, in a solution of fruits or vegetables containing sugar. This process is called **fermentation**. Starchy fruits or vegetables also produce alcohol on fermentation, because the starch is changed to sugar, which is then fermented by the yeast. The growth of the yeast plant changes the sugar to alcohol and carbon dioxide.

Appearance of the Patient.—After an ordinary dose of any alcoholic liquor the patient usually becomes cheerful, is satisfied with himself, his surroundings, and those about him. He is perhaps more active and more talkative. The face is flushed, the eyes are bright and there is a feeling of warmth. The pulse is rapid and bounding and the breathing is deeper.

Action

Local Action: Applied to the skin, alcohol causes redness and itching. It hardens the skin, checks the sweat and

ALCOHOL

acts as an antiseptic. Because it evaporates quickly, it makes the skin feel cold.

On mucous membranes: It causes a burning sensation and contracts the cells of the mucous membrane.

Internal Action.—In the mouth: Alcohol has a burning taste, it increases the flow of saliva, reddens and contracts the lining membrane of the mouth.

In the stomach: Small quantities of weak alcoholic drinks, aid the appetite, increase the secretion of gastric juice, and the peristaltic contractions of the stomach.

In the intestines: Excessive doses may cause mild bowel movements; some preparations, such as brandy, check diarrhea.

Action after Absorption

Alcohol is very rapidly absorbed, usually in about fifteen minutes. Most of the alcohol enters the blood through the lining membrane of the stomach, but a small part passes through the mucous membrane of the intestines.

After absorption alcohol affects principally the circulation, the respiration, and the brain.

Action on the Circulation.—The heart beats faster and somewhat stronger, causing a rapid bounding pulse with an increase in blood pressure. At the same time the skin becomes flushed by dilatation of its blood vessels.

It increases the contractions of the heart muscle and lessens the impulses sent from the medulla to slow the heart.

In large doses it lessens the contractions of the heart muscle.

In weakened conditions alcohol may act as a food, supplying the heart with energy and thus increasing its muscular contractions.

Action on the Respiration: Alcohol makes the breathing deeper and more rapid.

Action on the Nervous System: Alcohol progressively lessens the action of the brain. It begins by affecting the highest intellectual activities, such as will power, judgment, reasoning. It then affects the motor and sensory functions. Finally it lessens the action of the entire brain and of the medulla as well.

Effect on Temperature: Alcohol lowers the temperature because the dilated blood vessels of the skin make the body lose heat.

Effect on Nutrition: Alcohol has a distinct food value. About 90 per cent. of the alcohol absorbed is used up in the body. It combines with oxygen and is changed to carbon dioxide and water. In this way it provides energy

ALCOHOL

for the activity of the body cells. It is able, therefore, to take the place of such foods as carbohydrates (starches, sugars) and fats.

It is only suitable for temporary use, however, as in fevers; because if given for a long time, alcohol injures the various organs and tissues of the body. This may neutralize any effect it may have as a food.

Action on the Kidneys: Alcohol slightly increases the flow of urine.

Excretion

About 90 per cent. of every dose of alcohol given is used up in the body. The rest is rapidly eliminated by the kidneys, the lungs, and the skin, in the urine, the expired air, and the sweat.

Acute Alcoholism

Acute alcoholic poisoning results from drinking alcoholic liquors to excess. The effects constitute the familiar and far too common picture of drunkenness.

Symptoms.—The effects may be divided into two stages: The stage of excitement, in which all the higher functions of the brain are lessened, and the stage of stupor when all the brain actions are diminished.

Excitement Stage.—The individual is usually talkative; his thoughts flow freely. The speech may be brilliant, but it is careless, loud, coarse and incoherent. He usually moves about in an undignified manner but his gait soon becomes unsteady and staggering. The face is usually flushed and the pulse and breathing are rapid.

When larger quantities are taken, the staggering gait becomes very marked, nausea and vomiting occur and the patient passes into—

The Stage of Depression.—The individual now falls into a deep sleep from which he can only be awakened with great difficulty (stupor). All his sensations are lessened and he may not feel pain. His muscles are relaxed; and this frequently saves him from a fracture after a severe fall. His face is blue, the breathing is slow and snoring in character (stertorous) and the pulse is rapid, strong and bounding. Frequently there is loss of control of the rectum and bladder.

When awakened he is usually dull and stupid and falls limply back with a thud. Finally he passes into a condition of coma (a deep sleep in which he cannot be aroused) and collapse, with a rapid, weak, thready pulse, and dies.

The effects of overdoses of alcohol vary with different individuals. Some become sentimental, others quarrelsome,

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and still others fall asleep and have no excitement stage at all.

Fatal results have occurred from a dose of one pint of whiskey.

Treatment.—1. Wash out the stomach.

2. Give artificial respiration if the breathing is slow and shallow.

3. Apply cold applications to the head.

4. Keep the patient warm.

5. Stimulants, such as strychnine, caffeine or a hot coffee enema are usually given.

Chronic Alcohol Poisoning, "Alcoholism"

Chronic alcohol poisoning results from habitually taking alcoholic liquors, especially distilled liquors, such as whiskey, gin, etc., which contain large percentages of alcohol. Rarely, the symptoms result from habitually drinking beers or wines.

Delirium Tremens

This is a special kind of temporary alcoholic insanity, which occurs in habitual drinkers, when they receive any shock. This may be the result of an injury, hemorrhage, an infectious disease, or a surgical operation. The symptoms are due to the patient being deprived of his usual amount of alcohol.

The most common symptoms are **hallucinations of the various senses, abnormal fear, tremors of the muscles and excitement.**

The patient often sees various animals, such as snakes, rats, dogs, etc., before him (hallucinations of sight) or he feels them creeping upon him (hallucinations of touch). Often he hears voices and is constantly talking to those who seem to be speaking to him. The patient usually has twitching of the muscles of the extremities and is afraid of everybody about him.

Delirium tremens may be avoided by giving alcohol regularly to those patients who take it habitually; whenever they are subject to any shock, or when they have undergone a surgical operation.

Uses

Locally, alcohol is used for the following effects:

1. To harden the skin and prevent bed sores.
2. As an antiseptic; 50-70 per cent. alcohol is the best preparation for such use.

Internally, alcohol is used in the following conditions:

1. As a cardiac and respiratory stimulant in cases of fainting, shock and collapse. Whiskey and brandy are the preparations used for this purpose.

ALCOHOL

2. To check a cold after exposure, whiskey or brandy in hot water relieves the congestion of the internal organs, by widening the vessels of the skin.

3. In acute infectious diseases, such as typhoid fever, septicemia, and pyemia, whiskey may be given as a food, to reduce fever, to lessen nervousness and to induce quiet and sleep.

In such cases, the pulse will become slower, the temperature is lowered, the breathing becomes slower and deeper. The delirium and other nervous symptoms are lessened, and sleep is induced. The tongue becomes moist and the skin perspires more profusely.

When these effects are produced, alcohol is acting favorably.

When, however, the pulse becomes rapid, the delirium, restlessness, uneasiness, and other nervous symptoms are increased, the sleeplessness increases and the tongue and the skin remain dry, the alcohol is acting unfavorably, and the symptoms should be reported to the physician.

4. In convalescence it is given as a food and for its soothing effect. In poisonous snake bite, alcohol, in the form of whiskey or brandy, should be given in very large doses.

5. Beer, brandy, or whiskey and water, may be given at bedtime to produce sleep, especially when the inability to sleep is due to mental work or nervous strain.

6. Brandy occasionally checks diarrhea.

7. Dilute alcohol is a very valuable antidote for carbolic acid poisoning.

Tolerance

Individuals who take alcoholic beverages habitually, can take large quantities of such drinks without any of the usual poisonous symptoms being produced. This condition is known as tolerance for alcohol. To obtain effects in such individuals, much larger doses than usual must be given, often even more than twice the usual dose.

Administration

For local use the preparations of alcohol are used.

For internal use alcoholic liquors are principally used.

For temporary use and for immediate effects the distilled liquors, such as whiskey or brandy, are used.

They are best given hot, undiluted. Ordinarily, however, brandy or whiskey is best given diluted in a glass of vichy or seltzer filled with cracked ice, or with milk and egg in the form of a **milk punch** or **egg nogg**.

In collapse brandy and whiskey are frequently given hypodermically.

ALCOHOL

For continued use the fermented liquors such as wine or beer are used.

Preparations

Alcohol.—This contains 95 per cent. of ethyl alcohol by volume. It is used for rubbing the skin, to prevent bed sores. It is also used for burning purposes in alcohol lamps.

Absolute alcohol contains 99 per cent. of ethyl alcohol. It is not ordinarily used, except by pharmacists and in laboratories.

Dilute alcohol contains about 50 per cent. of ethyl alcohol by volume and about 41 per cent. by weight. This is the best preparation to use for antiseptic use.

For Internal Use

Whiskey (Spiritus Frumenti); dose half an ounce. This contains about 44 to 50 per cent. of ethyl alcohol by weight, and about 50 to 56 per cent. by volume. It should be at least four years old, because the fresh preparations are too injurious to the tissues.

Brandy or Cognac (Spiritus Vini Gallici); dose half an ounce.

This contains about the same percentage of alcohol as whiskey. Brandy should be at least four years old, because the fresh preparations are too irritating. Brandy contains small quantities of tannin. As a result, it has a tendency to contract mucous membranes. It is therefore more soothing to the stomach and intestines, and has a tendency to constipate and check diarrhea.

Rum; dose half an ounce. Rum contains the same percentage of alcohol as whiskey.

Gin; dose half an ounce. Gin contains about the same percentage of alcohol as whiskey. Because of the juniper which it contains, gin increases the flow of urine (diuretic).

Wines

Wines are fermented liquors, made from grapes. Besides the alcohol, wines contain various acids, such as tartaric and tannic acids, and some volatile oils.

White Wine (Vinum Album)

White wines contain 7 to 12 per cent. of alcohol.

Dry wines are those which contain no added sugar.

Sweet wines are those which contain sugar which has been added.

Sparkling wines are those which are bottled before fermentation is complete. They contain carbon dioxide gas, and effervesce.

ALCOHOL

Champagne is the most commonly used sparkling white wine and contains about 10 per cent. alcohol.

Champagne should be given ice cold, in teaspoonful doses. It is particularly valuable in cases of nausea and vomiting, for example, after an operation.

Champagne is not so effective when the gas escapes. This may be avoided by inserting a special tap in the cork, and keeping the bottle on ice, upside down.

Red Wine (*Vinum Rubrum*)

Red wines are made by fermenting colored grapes with the skins. They contain a larger percentage of alcohol than the white wines.

Dry Red Wines:

Claret contains about 8 to 10 per cent. of alcohol.

Sherry (*Vinum Xericum*) contains about 15 to 20 per cent. of alcohol.

Port Wine (*Vinum Portense*) is the strongest red wine, and contains about 20 to 40 per cent. of alcohol.

Sweet Red Wines: The most commonly used sweet red wines are burgundy and madeira. They contain from 6 to 20 per cent. of alcohol.

Sparkling Red Wines: The most commonly used sparkling red wine is sparkling burgundy, which contains about 10 per cent. of alcohol.

Uses of Wines

The wines are not as stimulating as the distilled liquors, such as whiskey or brandy. They are better suited, however, for continued use. They aid digestion when taken during meals. Sweet wines, however, are apt to disturb digestion.

The wines contain tannic acid and contract mucous membranes (astringent action). They are therefore more constipating than the distilled liquors.

Sparkling wines, such as champagne, are soothing to the stomach when given in small doses. They are not as stimulating to the heart. Champagne causes intoxication rapidly, in spite of the small quantities of alcohol which it contains. When taken in larger quantities it is apt to cause headache, pain in the stomach, nausea, hiccough, etc.

Beers

Beers are made by fermenting starchy grains. They are usually made by fermenting brewed barley malt with hops.

Ale, porter and stout, are the various kinds of beers that are used. They contain about 3 to 10 per cent. of alcohol with a large amount of solids, mainly sugar and starches.

ALCOHOLISM

Because of the starches and sugar which they contain, beers are very nutritious. They occasionally disturb digestion, however.

Liqueurs are preparations of volatile oils containing alcohol. Many of them contain sugars. Kirchwasser is a liqueur which contains very small quantities of hydrocyanic acid.

ALCOHOLISM

See ALCOHOL.

ALE

See ALCOHOL.

ALKALIES

An alkali is a substance which belongs to a group of chemical substances called bases. Alkalies combine with acids to form salts. They dissolve proteins, forming protein combinations which act like salts. They also combine with fats to form soaps.

The substances commonly used as alkalies are the salts of the following elements: **Sodium, Potassium, and Ammonium.**

Local action: Weak solutions of alkalies make the skin feel soft and soapy, by dissolving the superficial epidermis, or horny layer of the skin. Concentrated solutions destroy the skin and underlying tissues, forming a soft crust, which soon falls off, leaving an ulcer. Mucous membranes are affected in the same way as the skin. Alkalies and their salts readily dissolve mucus.

Internal Action.—Sodium Bicarbonate is the preparation commonly given internally.

In the mouth: The alkalies have a characteristic alkaline taste.

They dissolve the mucous secretions, redden and soften the lining membrane of the mouth and tongue and make the mouth feel soapy.

In the stomach: They neutralize and lessen the formation of the acid in the stomach by combining with the acid to form salts.

In the intestines: The alkalies enter the intestines as salts which have been formed in the stomach. They withdraw fluid into the intestines from the blood and tissues, which then distends the intestines and causes frequent movements of the bowels. They also dissolve the mucus in the intestine.

Action after Absorption.—Some of the salts of various

ALKALIES

alkalies or those formed in the stomach are readily absorbed into the blood. These salts make the blood more alkaline in reaction, and thereby relieve various conditions due to diminished alkaline salts in the blood (acidosis). They have no selective action on any of the organs of the body.

Excretion.—The alkalies and their salts are excreted mainly by the kidneys, increasing the flow of urine at the same time. They lessen the acidity of the urine or make it alkaline in reaction. They are also slightly excreted by the mucous membranes.

Poisonous Effects of Alkalies

Acute poisoning frequently results from some of the alkalies when they are taken by mistake. Washing soda, lye, or sodium carbonate is commonly used for cleaning purposes. It is found in every household, and if carelessly left around the house, it is occasionally taken by children, producing very serious symptoms.

Symptoms.—The symptoms usually appear in a few minutes after the alkali has been taken.

1. **The tissues about the lips and mouth are destroyed** and covered with a swollen white crust, and there are pieces of bloody moist shreds of tissue around the lips and mouth.

2. **Severe abdominal pains.**

3. **Profuse vomiting.** The vomited matter contains pieces of mucous membrane and blood.

4. Occasionally there is diarrhea, the stools containing blood and pieces of mucous membrane.

5. Collapse (rapid thready pulse, slow shallow breathing, cold moist skin, and dilated pupils).

The patient may die of collapse, or occasionally from a perforation of the stomach wall, resulting from the destructive action of the alkali.

If the patient recovers from the acute symptoms, the scars which form at the areas in the esophagus and stomach where the tissue was destroyed, make these organs narrower (stenosis). This condition may necessitate radical surgical treatment.

Treatment.—1. Give as an antidote, a dilute vegetable acid such as lemon juice, vinegar or dilute acetic acid.

2. Protect the mucous membrane by egg albumin, oils or milk.

3. The collapse is treated with heart stimulants; such as caffeine, strychnine, atropine, digitalis, etc., and the patient should be kept warm.

Do not wash out the stomach, since passing a stomach tube may cause a perforation of the stomach.

ALKALIES

Uses of the Alkalies

The alkalies are principally used for the following conditions:

1. To neutralize the acid in the stomach, in **hyper-acidity**, a condition where there is too much acid secreted in the stomach. It is also given in **ulcer of the stomach**. In this condition pain is due to the excessive amount of acid formed in the stomach, which is neutralized by the alkalies. In these cases the alkalies are best given about a half to one hour after meals, when the stomach contains the largest amount of acid.

2. They are also used to dissolve mucus and other secretions.

3. To increase the alkaline salts in the blood in cases of diabetic coma and other similar conditions due to excessive formation of acids in the body (acidosis).

Administration

To neutralize acids, alkalies should be given after meals, only slightly diluted to lessen absorption.

To increase the alkaline reaction of the blood they should be given between meals in large quantities of water to increase absorption.

In cases of coma they may be given intravenously or by rectum in the form of a proctoclysis.

Preparations of the Alkalies

SODIUM COMPOUNDS

Sodium is a metallic element. It is found in nature in various forms:

1. As sodium chloride or salt.
2. As sodium nitrate.
3. As borax or sodium borate.

Preparations

Sodium Hydroxide (Caustic Soda). This comes in white sticks, which readily take up moisture from the air. It is occasionally applied as a caustic, to destroy tissue. It often causes severe injury to the tissues.

Solution of Sodium Hydroxide; dose 15 to 60 minims.

This is a 5 per cent. solution of sodium hydroxide in water.

Monohydrated Sodium Carbonate; dose 5 to 30 grains.

Sodium Carbonate (Washing Soda); dose 5 to 30 grains.

These two preparations are rarely used internally. Externally they are used to dissolve mucous and other secretions. They are frequently used to clean glass, china, wood-

ALKALOIDS

work, etc. They frequently cause poisonous symptoms when taken by mistake.

Sodium Bicarbonate; dose 5 to 15 grains.

This is the most commonly used preparation. It is applied locally to soothe the skin in burns. Internally it is said to neutralize the acid in the stomach, and to relieve the pains resulting from excessive acid. It is given in seltzer or vichy. It is frequently used to soothe the stomach and to lessen vomiting.

POTASSIUM COMPOUNDS

The salts of potassium act like the sodium compounds with the following variations in their effects:

1. Concentrated solutions, such as potassium hydroxide, have a greater destructive action on the skin. They destroy the skin and underlying tissues, causing an ulcer when the resulting crust falls off.

2. The salts of potassium when absorbed into the blood, slightly weaken and slow the contractions of the heart.

3. They increase the flow of urine more than the sodium compounds.

The potassium salts are very rarely used as alkalies.

Preparations

Potassium Hydroxide (Caustic Potash). This comes in white sticks which take up moisture from the air. It is used principally as a caustic, to destroy tissues. When this is applied locally, the surrounding tissues about the spot to be cauterized should be well protected owing to its violent action.

Solution of Potassium Hydroxide; dose 10 to 30 minims. This contains 5 per cent. of potassium hydroxide.

Potassium Carbonate; dose 5 to 30 grains.

Potassium Bicarbonate; dose 5 to 30 grains.

Potash and Lime (Potassa cum Calce).—This is known as Vienna paste, and consists of equal parts of potash and quicklime and is used locally as a caustic.

ALKALOIDS

An alkaloid is an active principle, found in plant drugs or made chemically, which acts like an alkali. (An alkali is a chemical substance which combines with acids to form salts. It turns red litmus paper blue.) Alkaloids also combine with acids to form salts, which have the same effects as the alkaloids themselves.

Chemically, alkaloids consist largely of carbon, hydrogen and nitrogen; some of them also contain oxygen.

ALOES

The alkaloids do not dissolve readily in water, but their salts are very soluble and are the preparations principally used.

The alkaloids and their salts form a precipitate when tannic acid or potassium permanganate is added to them, but this precipitate is not soluble and is therefore not absorbed, thus making the alkaloids inactive. For this reason tannic acid or potassium permanganate may be used as an antidote in cases of poisoning by any of the alkaloids.

The names of all the alkaloids end in "ine."

ALOES

Aloes is the dried juice of several species of **Aloes**, a plant growing in Barbados, and elsewhere. The active principle is aloin.

Aloes acts principally on the large intestine, causing irritation, with dilatation of the blood vessels. This action results in peristalsis, causing frequent movements of the bowels. Aloes is seldom administered alone, but is usually given together with other purgatives.

Preparations

Pills of Aloes; dose 1 to 5 pills. Each pill contains 2 grains of aloes.

Pills of Aloes and Iron; dose 1 to 5 pills. Each pill contains 2 grains of aloes.

Pills of Aloes and Mastich (Lady Webster's dinner pill); dose, 1 to 5 pills; each pill contains 2 grains of aloes.

Pills of Aloes and Myrrh; dose 1 to 5 pills. Each pill contains 2 grains of aloes.

Aloin (active principle); dose 1 to 4 grains.

Lapactic Pills or **Pilulæ Laxativæ Compositæ**, or **A. B. & S. pills**; dose 2 pills. Each pill contains: Aloin, $\frac{1}{4}$ grain; Extract of Belladonna, $\frac{1}{8}$ grain; Strychnine, $\frac{1}{120}$ grain; Powdered Ipecac, $\frac{1}{15}$ grain.

Tincture of Aloes; dose one-half to two drams.

Aloes is also contained in the **compound rhubarb pill**, **compound extract of colocynth**, and **compound tincture of benzoin**.

ALTERATIVES

Alteratives are drugs whose mode of action is unknown, but which improve the nutrition of the tissues, and help to absorb diseased tissues, thereby restoring them to their normal condition. Most of the drugs so used have other, important, actions. The chief alteratives are Iron, Arsenic, Phosphorus, Mercury, and the Iodides.

AMENORRHEA

ALUMINIUM AND ALUM

Aluminium is a light metal. The only salt of aluminium which is used in medicine is the aluminium and potassium sulphate, or alum.

Uses

Alum is used principally as an astringent to contract mucous membranes.

It is used as a gargle in 1 to 5 per cent. solutions.

For douches, and as a lotion on the skin and mucous membranes, it is used in $\frac{1}{2}$ to 1 per cent. solutions.

Large doses of alum are occasionally used to produce vomiting.

Preparations

Alum; dose 5 to 15 grains.

This is aluminium and potassium sulphate. Alum is very injurious to the teeth, and when given internally, it should be given through a glass tube.

Dried Alum or Burnt Alum (Alumen Exsiccatum).—

This is alum which has been dried by heat. It absorbs moisture from the air. It is often combined with 1 to 5 parts of alcohol to harden the skin, and prevent bedsores.

The other salts of aluminium, such as the aluminium acetate and the aluminium chloride are used as antiseptics.

Solution of Aluminium Acetate (Burrow's solution).—

This is used in $\frac{1}{2}$ to 2 per cent. solutions as an antiseptic.

ALUMNOL

Alumnol (Alumini Naphtholsulphonas).—This is used in $\frac{1}{4}$ to 1 per cent. solutions as a surgical antiseptic, as a gargle and for douches.

ALYPIN

Alypin is an artificial alkaloid which is used as a local anesthetic. It is supposed not to produce poisonous symptoms.

It is used principally as a local anesthetic for eye operations, and in the urethra and bladder, before passing instruments into these organs.

In the eye it is used in 1 to 2 per cent. solutions. On other mucous membranes, it is used in 1 to 10 per cent. solutions.

Preparation

Alypin Tablets. Each tablet contains $\frac{1}{3}$ to 3 grains.

AMENORRHEA

See MENSTRUATION.

AMERICAN HELLEBORE

AMERICAN HELLEBORE

See VERATRUM VIRIDE.

AMERICAN WORMSEED

See CHENOPODIUM.

AMETROPIA

See ACCOMMODATION.

AMMONIUM

Ammonium is a solution of ammonia gas in water.

Appearance of the Patient

When ammonia gas is inhaled, it causes redness of the conjunctiva of the eye, a profuse flow of tears, a flow of mucus from the nose, and sneezing. It also causes severe coughing with excessive secretion of mucus from the bronchi; the pulse is stronger and faster, and the breathing is deeper and more rapid. These effects appear almost immediately, but last for a very short time.

A weak solution of ammonia makes the skin red and soft. The skin feels slippery, as if it were covered with soap. Stronger solutions, if kept in contact with the skin and prevented from evaporating, form blisters, often destroying the skin.

When ammonia is absorbed from the lining membrane of the stomach, it produces no effects; because it is changed at once to urea, one of the constituents of the urine. It therefore increases the amount of urea in the urine.

Ammonia is usually given by inhalation and it produces its best effects in this manner; they are not very lasting however. When given by mouth, the same but more lasting effects are produced. The drug is absorbed from the stomach in the form of ammonium chloride, which is formed by the combination with the hydrochloric acid in the stomach.

Ammonia affects principally the heart and the respiration. It makes the heart beat stronger and faster, causing a strong and rapid pulse; it makes the breathing more rapid and deeper.

Poisonous Effects

When a strong solution of ammonia is taken, the following symptoms result almost immediately.

The patient complains of **severe burning pain in the mouth, throat and stomach.** The lips, mouth, throat, esophagus and larynx are inflamed and swollen. Often the superficial tissues of these organs are destroyed. The **swell-**

AMMONIUM

ing of the larynx may be so severe as to obstruct the breathing and the patient may choke to death because he is unable to get air into his lungs.

In addition to these symptoms, the patient feels nauseated, and vomits profusely. The vomited matter contains blood and pieces of the mucous membrane of the stomach.

The continual vomiting and the destruction of the lining membrane of the stomach cause the symptoms of collapse: pale, cold, moist skin; rapid, weak, thready pulse; slow, shallow breathing; finally stupor, coma and death. Death may result in a few minutes from asphyxia, or later from collapse.

If the patient recovers, the resulting scars which form in the esophagus from the destruction of the tissues, may cause stricture (a narrow condition) of the esophagus.

This may cause starvation from inability to swallow food.

Treatment

1. Neutralize the ammonia with dilute acids, that are not themselves injurious. Vinegar and lemon juice are the best acids to use.

2. Protect the lining membrane of the esophagus and stomach with milk, oils, albumen water and other protecting drinks.

3. The collapse is usually treated with heart stimulants, such as caffeine, atropine and strychnine.

4. Do not keep the patient warm, as heat increases the action of ammonia. Apply cold applications to the head and give plenty of cold air.

5. If the patient suffers from asphyxia, incising the trachea (tracheotomy) may save the patient's life.

6. For the resulting stenosis of the esophagus, bougies are passed, or surgical interference may be necessary.

Uses

Ammonia is used for the following conditions:

1. As a heart stimulant for temporary effect, for example, in fainting.

2. In the form of liniments, to relieve pain.

3. To neutralize the acid of the gastric juice.

4. To check the formation of gas in the stomach.

5. To increase the cough and expectoration.

Preparations

Strong Ammonia Water.—This contains about 28 per cent. of ammonia gas. It is never given internally. It is used locally, applied to snake bites and to form a blister to withdraw fluid from the deeper tissues.

AMPUTATIONS

Ammonia Water; dose 10 to 30 minims. This contains 10 per cent. of ammonia gas.

Aromatic Spirit of Ammonia; dose one half to one dram.

This contains ammonia water and 4 per cent. of ammonium carbonate, together with the oil of nutmeg, oil of lemon and oil of lavender. It is used principally to overcome fainting, as a carminative, and to relieve nausea.

Solution of Ammonium Acetate (Spirit of Mindererus); dose 1 to 4 drams.

This is used principally to increase sweating (diaphoretic) and to increase the flow of urine (diuretic).

For Local Use

Ammonia Liniment.—This is a $3\frac{1}{2}$ per cent. solution of ammonia in alcohol and cottonseed oil.

Ammonium Carbonate; dose 5 to 10 grains.

This is used as a heart stimulant and as an expectorant.

Ammonium Chloride is an alkaline salt formed by the combination of ammonia and hydrochloric acid.

It is used principally to increase the cough and expectoration. Dose 5 to 15 grains.

Poisonous doses cause the following symptoms:

1. Nausea and vomiting.
2. Bleeding from the mucous membranes.
3. Collapse.

AMPUTATIONS

Ante-operative Treatment.—The area, through which the amputation is to be done and the skin for a considerable distance above and below, should be shaved and cleansed very carefully. If there are any open sinuses they should be protected by packing and sterile dressings, so that their discharge will not contaminate the wound.

To prevent hemorrhage during amputation there are several methods devised which aim to compress the blood vessels supplying the limb in question.

Esmarch's Method.—This method attempts to squeeze all the blood out of the limb by applying an elastic bandage which is wound spirally from below upward, well above the region of amputation. At the upper limit, an ordinary rubber tubing tourniquet is applied and fastened. The elastic bandage is then removed. This is not applicable in septic conditions, nor in cases of tumor.

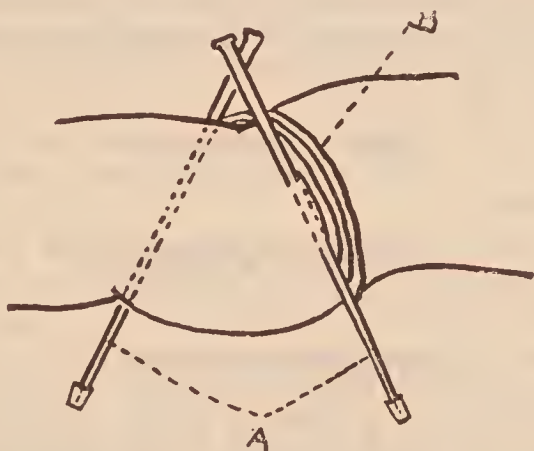
Lister's Method.—Here the limb is elevated for a few minutes and the ordinary tubing applied in a horizontal fashion as a simple tourniquet.

Tourniquets.—These should always be applied well above the region to be amputated, and should be sterilized. When

AMPUTATIONS

the amputation is to be done near the hip or the shoulder, strips of sterile bandage should be applied around the tourniquets. These are held firmly by an assistant to prevent the tourniquet from slipping. Some surgeons prefer to use Wyeth's pins, elongated steel pins which are pierced through the muscles, and the tourniquet in pressing against these is prevented from sliding off.

Amputation Operation.—The technique of the operation is variable. Some surgeons will inject all nerve trunks with novocaine before cutting them. The bone stump is treated in various manners so that a full armamentarium of bone instruments should always be on hand. Amputation wounds are usually drained. The dressings applied should be large and pressure should be evenly exerted either by adhesive



Method of applying Wyeth's pins. A, Wyeth's pins; B, tourniquet.

(From Colp and Keller's Textbook of Surgical Nursing)

strips or bandage. As a rule the stump should be elevated. Sometimes a small splint is applied to the stump to immobilize it in a more efficient manner.

After-Treatment.—These patients are apt to suffer from considerable shock so not only must this condition be watched for, but also the danger of secondary hemorrhage. It should be routine practice to have an emergency tourniquet set very near the patient's bed so that should bleeding occur no time may be lost in arresting the hemorrhage. If the oozing is marked, the dressing may be reinforced or changed in twenty-four hours, although it is better to wait forty-eight hours.

Occasionally when the wound has almost healed it is necessary to apply pressure to certain flaps or skin areas to relieve tension. This pressure can be obtained by thin bandaging or by adhesive strappings. In bandaging, it is always to be remembered that the turns which pass over the stump

AMYL NITRITE

should be begun from above downward and on the side where the longer flap is. Sometimes when the flaps have been cut too short, it may be necessary to apply traction to pull the muscles over the stump.

While the stage of healing is in progress, gentle massage to the muscle groups will do much to maintain their tone and health.

If the amputation is one of the lower extremity, the patient should be taught carefully the proper use of crutches. Crutches should not press into the axilla but the weight of the body should be sustained by the hand resting on the cross piece of the crutch. Special instructions should be given as to how to descend and ascend a pair of stairs, cautioning the patient to hold the banister with one hand and using the other hand to hold the supporting crutch. To prevent the crutches from slipping they should always be equipped with rubber tips.

AMYL NITRITE

See NITRITES.

AMYLENE CHLORAL

See DORMIOL.

AMYLENE HYDRATE

Amylene hydrate is a colorless liquid, having an odor resembling that of camphor, and a pungent taste. It produces sleep; its effects are similar to those of chloral, but they are not as marked. It weakens the contractions of the heart and lessens all muscular contractions.

It is best given in capsules or in water, flavored with licorice. Dose, 30 to 60 minims.

ANAPHALAXIS (SERUM SICKNESS)

In some individuals the injection of a serum causes some or all of the following symptoms: Fever; headache; urticaria (hives); edema of various parts of the body; attacks of asthma; collapse.

These symptoms are due to the injection into the tissues of a fluid that contains proteins of bacteria, animals or plants. When such proteins are taken as food anaphalaxis may not occur.

The symptoms may be avoided by finding whether the patient has been subject to attacks of asthma or hives, or whether previous injections of a serum have caused these symptoms.

(And See SERUMS.)

ANEMIA

ANEMIA

Anemia means the loss or destruction of red blood cells, of hemoglobin (the oxygen carriers), or of both. Every cell in the body suffers and smothers for the want of oxygen, so necessary for all the processes of metabolism. The result is muscular weakness, breathlessness and impaired function of every tissue and organ in the body. In **pernicious anemia** the marked cell destruction is shown in the greatly reduced red cell count and hemoglobin, the peculiar lemon color of the skin and fever. The patient becomes very weak and suffers from dyspnea, faintness, dizziness, palpitation and dyspepsia.

The effect on the *digestive system* is seen in the lessened hydrochloric acid in the stomach, loss of appetite, vomiting, diarrhea or constipation, abdominal pains, discomfort and distention. The patient suffers periodically from soreness or rawness, sometimes with ulcers of the tongue and mouth which may extend to the throat. This causes pain in chewing and eating, especially hot, acid, or spiced food.

The **Nursing Care** consists in providing absolute rest and freedom from all conditions, mental or physical, which increase the strain on the heart and other organs. Fresh air, sunlight, quiet but cheerful surroundings, freedom from care or worry, and plenty of sleep are essential. Every atom of strength should be conserved. Anemic patients feel the cold and should be protected not only for comfort, but to save energy otherwise used in keeping warm. Proper bathing, the care of the mouth, the regulation of the bowels and of the diet are extremely important. Every effort should be made to improve the appetite and to build up the strength by a nutritious diet. It should be plain, easily assimilated and contain foods rich in iron, such as eggs, spinach, fish and meats, etc. Extreme care should be taken during the periodic attacks of soreness and rawness of the mouth and impaired digestion; good digestion alternates with periods of bad.

The *drugs* used in anemia are iron and arsenic. Iron is used to aid the formation of hemoglobin. When iron is given watch for an upset stomach and constipation. Arsenic is given to stimulate the bone marrow in the formation of red blood cells. When arsenic is given note if the eyes become puffy or if the patient complains of stomach trouble or a cold in the head. These symptoms indicate poisoning.

Transfusions may be given to increase the volume of the blood, the number of red cells and hemoglobin, to increase the patient's resistance, and to stimulate the bone marrow.

ANESTHESIA

These treatments do not cure the disease but may prolong life for a number of years.

ANESTHESIA

See ANESTHETICS; and LABOR, MANAGEMENT OF.

ANESTHESIN

Anesthesin is a chemical substance used as a local anesthetic.

The effects of anesthesin are similar to those of cocaine. It produces local anesthesia, but no general effects, as it does not dissolve readily and is not absorbed.

It is used internally to relieve the pain of ulcers in the stomach or of cancer of the stomach. It is also applied to relieve pain on the mucous membrane of the nose, throat, urethra, etc., and on wounded surfaces.

Preparations

Anesthesin; dose 5 to 8 grains.

It is also used in the form of a powder or an ointment.

Cycloform; dose $1\frac{1}{2}$ to 3 grains.

It produces the same effects as anesthesin, but is somewhat antiseptic.

Propesin; dose 4 to 8 grains.

This acts like anesthesin and it also contracts the mucous membrane. It is often used in 1 to 20 per cent. ointments.

And See COCAINE.

ANESTHETICS

Anesthetics are drugs used to produce insensibility to pain, so as to enable a surgical operation to be performed painlessly. The anesthetics are divided into two groups:

1. **General anesthetics** are drugs which produce insensibility to pain and a loss of all sensations throughout the body. No sensory impulses are then received by the brain, and the patient becomes unconscious and falls asleep. The effects of the general anesthetics result from their circulation in the blood.

2. **Local anesthetics** are drugs which abolish sensations only on the particular area of the body where they are applied. Since they do not abolish all sensory impulses, they do not produce unconsciousness.

ETHER

Ether is a colorless liquid formed by the combination of sulphuric acid and alcohol. It evaporates very easily, is very

ANESTHETICS

inflammable and has a very disagreeable odor and a burning taste.

Appearance of the Patient

Ether Anesthesia

Symptoms of the First Stage of Anesthesia.—The patient has probably undergone various preparations for the operation, and has pictured in his mind various ideas of pain and suffering that the operation might produce. This makes him quite nervous and anxious, and the pulse quite rapid. He therefore regards every act of the doctor or nurse with suspicion. When the mask is applied to the face, the difficulty of obtaining air causes a **choking sensation**, and the inhalation of the ether causes a burning pain in the throat, which often makes him cough and causes a **profuse flow of saliva**. Soon there is a feeling of warmth all over the body and the sensations become dulled. **The sense of touch is blunted**, objects are seen through a mist, and sounds appear to be at a distance. Often ringing, hissing or roaring sounds are heard. The muscles become stiff and the arms are held rigid. **The face is flushed**, the pupils are dilated, but they react to light. The pulse is rapid, and the breathing is rapid and irregular on account of the coughing and choking sensation. These effects last for about five or ten minutes and are soon followed by—

The Second Stage or Excitement Stage.—This stage begins with **movements of the arms**. The patient tries to push the mask away, and attempts to get up. Many patients struggle violently, others shout, sing, groan, or burst into fits of laughter.

The pulse during this stage is rapid, the skin is flushed, often blue, the breathing is irregular because of the struggling. These symptoms last for a few minutes, the struggling then becomes lessened, the shouting and talking become indistinct, the breathing becomes very shallow and the patient passes into—

The Third Stage, or the Stage of Anesthesia.—The patient now becomes calm, quiet and unconscious. All sensibility is gone. **The muscles are relaxed** and the reflexes disappear, so that when the skin is touched or incised, no response or movement is produced. Thus, touching the throat does not cause vomiting. The winking of the eyelids which occurs when the eye is touched, often remains for some time, however.

The pulse still remains rapid and strong, though it is slower than during the first and second stages. **The breathing is deep and rapid** and is often snoring in character.

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The pupil is usually contracted, and reacts to light and accommodation.

This stage of anesthesia may be kept up for hours by judiciously pouring small quantities of ether on the mask.

When the ether is stopped, the patient may again become somewhat excited and talkative, he feels nauseated and vomits. He then slowly regains consciousness, often remaining asleep for a few hours before consciousness is regained, and complains of headache and dizziness for hours afterward.

Excretion

Ether is very rapidly eliminated from the body, by the expired air of the lungs, usually in about a half hour. When given as an anesthetic, it is entirely excreted in about 24 hours; the breath has its unpleasant odor during that time.

Idiosyncrasies

The most common variations in the effects of ether are the following:

1. In some individuals, and in children, there may be no excitement stage.
2. Patients who have been used to taking alcoholic liquors regularly, require large quantities of ether to produce anesthesia. These patients usually struggle a great deal.
3. In some individuals, very small quantities may cause poisonous effects.

Poisonous Effects or "Ether Collapse"

Acute ether poisoning or ether collapse, usually results when too much ether is given to produce anesthesia.

Symptoms.—1. The first symptom which indicates that too much ether is being administered, is **slow, shallow and gasping breathing**.

2. The face then becomes blue and cyanotic and the breathing stops.

3. The pulse may not become affected, but it soon becomes weak and irregular.

4. The pupils are widely dilated, and do not react to light. The pulse gradually grows weaker, and death finally results from respiratory paralysis.

Treatment.—1. Stop anesthesia; take the mask away.

2. Give artificial respiration.

3. Elevate the foot of the table.

4. Stretch the sphincter of the rectum to induce breathing by the reflex action thus produced.

ANESTHETICS

5. Give heart and respiratory stimulants such as caffeine, strychnine, atropine, etc.

Usually, if the collapse is recognized early, these measures will revive the patient.

Dangers of Ether Anesthesia

The following symptoms occurring during anesthesia often warn the anesthetist of impending trouble:

1. Slow, shallow breathing.
2. Dilated pupils which do not react to light.
3. Slow, weak, irregular pulse.
4. Often the relaxed muscles of the tongue cause the tongue to fall back and obstruct the breathing.
5. In some cases, continued vomiting of the contents of the stomach and intestines, during deep anesthesia, may cause food particles to enter the lungs and cause asphyxia. This can be avoided by constantly keeping the mouth thoroughly mopped out.

Dangers Following Anesthesia

The most common condition that may occur after ether anesthesia is pneumonia. This may result from the injurious effect of ether on the lungs.

Preparations for Anesthesia

Before administering ether, the following measures should always be carried out, but the nurse must receive these orders from the surgeon.

1. Move the bowels by a cathartic, about twelve hours before the operation, and give an enema the morning of the day the patient is to be operated upon.
2. Do not give any food or drink for about twelve hours before the operation. This often lessens the vomiting after the anesthesia.
3. Catheterize the patient before the operation.
4. **Remove all false teeth**, so that the patient will not swallow them during the anesthesia.
5. When the anesthesia is begun, the eyes should be covered with a piece of gauze, and the face protected with vaseline to avoid the injurious effects of the ether fumes.

Administration

To produce anesthesia, ether is given by inhalation through a mask held over the nose and mouth, in the following ways:

The Open Method or Drop Method

The ether is poured drop by drop on a mask covered with gauze, and the patient is then allowed to inhale the ether

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vapor which is thoroughly mixed with air. This is the most common method of administration now in use.

The Closed Mask Method

This method is gradually being abandoned. The ether is given through a cone saturated with ether, which is thus mixed with very little air.

Gas-Ether Method

This is a very common method now in vogue, whereby the patient is first given nitrous oxide gas, and then ether. In this way, many of the unpleasant effects of ether, and the excitement stage, are avoided.

There are numerous kinds of apparatus for giving ether by this method, many of which have various advantages, such as warming the vapor, etc.

In giving an anesthetic, it is important that the drug be administered very slowly. The breathing and pulse should be watched very carefully throughout the anesthesia, so as to avoid serious dangers.

Uses

Besides its use as an anesthetic, ether is used for the following effects:

1. As a heart stimulant.
2. To check convulsions.
3. As a carminative, to lessen the formation of gas in the stomach and intestines.

Preparations

Ether; dose 8 to 15 minims. This contains 96 per cent. of ether, and is used principally as an anesthetic. The dose of ether for anesthesia varies with the patient, and the degree of anesthesia desired.

Spirit of Ether; dose one-half to one dram.

This consists of 32 parts of ether and 68 parts of alcohol.

Compound Spirit of Ether (Hoffman's Anodyne); dose one-half to one dram.

This contains 32 per cent. of ether, alcohol and other substances known as ethereal oils. It is used principally to check the formation of gas in the stomach and intestines, and as a remedy for fainting. It is usually diluted with cold or iced water.

Spirit of Nitrous Ether (Sweet Spirit of Niter); dose fifteen to sixty minims.

This preparation is used to increase the perspiration and the flow of urine, but it also causes the same stimulating effects as ether.

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CHLOROFORM

Chloroform is a colorless non-inflammable fluid, which evaporates easily, but not as rapidly as ether. It is used principally as an anesthetic.

Chloroform Anesthesia

When chloroform is given as an anesthetic, the symptoms it produces can be divided into three stages, as in ether anesthesia.

During the first stage, the patient is nervous, anxious, and his sensations are dulled, but the anesthetic is more pleasant to take than ether. The pulse is usually rapid.

Very soon, the second stage sets in, the excitement, talkativeness and struggling, however, are usually much less, and last for a shorter time than with ether. **This stage is very often entirely absent.**

The stage of anesthesia, or third stage, comes on very rapidly with chloroform. The patient is calm, quiet and unconscious. **The breathing is slow and shallow, the rate of the pulse is normal**, perhaps somewhat slower but weak. The face is pale, and the pupils are contracted, but they react to light. All sensibility and reflex action are gone, and the muscles are relaxed.

With chloroform, anesthesia is induced more rapidly than with ether, usually in about five or ten minutes. **The muscles become relaxed sooner, the pulse is weak and slower and the breathing is shallow.**

Excretion

Chloroform is rapidly eliminated, mainly by the expired air of the lungs; though some of it is also excreted by the urine and the perspiration.

Poisonous Effects

Chloroform poisoning occurs in two forms:

1. Acute Chloroform Poisoning

Acute chloroform poisoning usually results when too much chloroform is given as an anesthetic, or in susceptible individuals, from very small quantities, even from a few drops.

Sudden Chloroform Death

Sudden death occasionally occurs from chloroform, in susceptible individuals, even when only a few drops are administered for anesthesia.

This usually occurs during the first stage of anesthesia. **The pulse becomes very slow and weak, the face turns pale,**

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the breathing becomes very shallow and slow, the pupils are widely dilated, and the patient dies in a few minutes.

This very unfortunate occurrence is the result of the coughing and burning pains in the throat which occur during the first stage of anesthesia. Impulses are thus sent to the vagus center in the medulla, which then sends impulses to the heart to make it beat slower.

Such impulses usually cause fainting, which is a condition in which the heart stops beating for a few moments, but soon recovers again. In sudden chloroform death, however, the heart muscle is poisoned by the chloroform; so that after it has suddenly stopped beating it does not contract again, and death results.

If atropine is given before chloroform anesthesia, it occasionally acts as a safeguard against this dreaded accident. The atropine paralyzes the nerve endings of the vagus nerve in the heart, and prevents impulses to slow the heart contractions from reaching it.

When sudden chloroform collapse occurs, it is usually treated by giving atropine and other heart stimulants hypodermically, and massaging the chest over the heart. Every now and then patients recover after vigorous treatment.

Symptoms of Chloroform Collapse

When too much chloroform is given during anesthesia, the following symptoms usually result, in the order of their onset:

1. The pulse becomes slow, weak and irregular, usually about 50 or 40 to the minute.
2. Slow and shallow breathing.
3. Pallor of the skin.
4. The pupils are widely dilated, and do not react to light or accommodation.
5. The pulse and breathing become still slower, and the patient dies from paralysis of the heart.

Treatment

1. Stop the anesthesia, and take the mask away as soon as the slow and weak character of the pulse is noticed.
2. Stimulants such as atropine, caffeine, strychnine, etc., are usually given.
3. Give artificial respiration.
4. Elevate the foot of the table.

2. Delayed Chloroform Poisoning

This form of chloroform poisoning occurs occasionally. The symptoms appear about a few days after the anesthetic has been administered. It is due to the destruction of

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many of the cells of the liver, kidneys, and heart, which then become filled up with fat globules (fatty degeneration).

Symptoms.—Nausea and vomiting; the vomited matter containing bile.

2. Jaundice.
3. Delirium.
4. Convulsions.
5. Scanty urine, which contains albumen.
6. Collapse (slow, weak pulse, slow, shallow breathing, etc.).

The patient usually dies in a few days from profound collapse.

Administration

Chloroform is usually given by inhalation, by means of a mask covered with gauze, which is held over the patient's nose and mouth. A few drops of chloroform are poured on the mask and allowed to mix thoroughly with air. Dangers of chloroform are best avoided by pouring the chloroform very slowly, a drop at a time, and allowing the vapor to thoroughly mix with air.

The nurse is often called upon to give chloroform during labor, in obstetrical cases. Very little chloroform should then be given, as in such cases it is only necessary to administer the chloroform when the patient has severe pains. Complete anesthesia is not desired in these cases, as the uterine contractions are then lessened, and the birth of the child is thus retarded. The pulse and breathing should be watched very carefully throughout the anesthesia.

Uses

Besides its use as an anesthetic, chloroform is given:

1. To stop convulsions (by inhalation).
2. To check diarrhea and to lessen colic (by internal administration).
3. Chloroform liniment is frequently used as a local application to relieve pain.

Preparations

Chloroform; dose one to fifteen minims.

The dose of chloroform for anesthesia, varies with the patient and the degree of anesthesia desired.

Chloroform should always be kept in brown bottles, as it is readily decomposed into dangerous substances by the action of light.

Spirit of Chloroform; dose 30 to 60 minims.

This contains 10 per cent. of chloroform.

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Emulsion of Chloroform; dose half an ounce to one ounce.
This contains 4 per cent. of chloroform.

Chlorodyne; dose 5 to 30 minims.

This contains chloroform, ether, hydrocyanic acid, morphine and cannabis indica.

Chloroform Liniment.—This consists of soap liniment and chloroform, and contains 30 per cent. of chloroform.

Compound Chloroform Liniment.—This contains chloroform, oil of turpentine, laudanum, tincture of aconite, and soap liniment.

COMPARATIVE ACTION OF ETHER AND CHLOROFORM

ETHER	CHLOROFORM
1. Inflammable	1. Not inflammable
2. Cools the skin	2. Burns the skin
3. Unpleasant to take	3. More pleasant to take
4. Anesthesia induced with larger quantities, and not as deep	4. Deeper anesthesia induced with smaller quantities
5. Marked excitement stage	5. Little or no excitement stage
6. Pulse rapid and strong	6. Pulse slow and weak
7. Skin bright red in color	7. Skin pale
8. Suitable in cases where the heart action is weak or where the kidneys are diseased	8. Suitable in cases where the lungs are diseased or in drunkards

Dangers

- | | |
|-------------------------|---------------------|
| 9. Respiratory collapse | 9. Cardiac collapse |
|-------------------------|---------------------|

After-Effects

- | | |
|----------------------------|---|
| 10. More vomiting | 10. Less vomiting |
| 11. Apt to cause pneumonia | 11. Apt to cause delayed chloroform poisoning |

ETHYL BROMIDE

Ethyl bromide or bromide of ether, is a colorless liquid which evaporates easily. It has a disagreeable, sweetish taste, and an ethereal odor.

Ethyl bromide is used to produce anesthesia, especially for short operations, or to begin an ether anesthesia. Its effects are similar to those of chloroform, and it has the same weakening action on the heart. When its administra-

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tion is stopped, consciousness returns very quickly, and the patient feels quite weak. It is usually given as a concentrated vapor, mixed with very little air.

It should be kept in brown bottles, as it is decomposed very easily by the action of light, forming dangerous substances.

ETHYL CHLORIDE

Ethyl chloride, chloride of ether or kelene, is formed by the action of hydrochloric acid gas on alcohol. It evaporates very easily. It usually comes in special glass containers, with a long, pointed tip, which is broken off or unscrewed. A fine stream of vapor then shoots out, which is directed on the mask; or, for local anesthesia, on the skin.

Local action:—Because it evaporates very easily, ethyl chloride freezes the skin over which it is applied, producing local anesthesia of the part. Minor surgical operations can be performed under such local anesthesia. It should be applied until the tissues become white and hard, then stopped; if it is continued after this effect is obtained it is apt to injure the tissues.

General Action.—Ethyl chloride is also used as a general anesthetic. It produces anesthesia very rapidly, usually in about 1 to 5 minutes.

Its effects are similar to those of chloroform, but it does not cause complete muscular relaxation. **The pulse is slow and weak**, and the breathing is deep. The patient usually recovers from the effects very rapidly. It is usually given to start an ether anesthesia. It is not suitable for prolonged use, because it weakens the heart even more than chloroform and it does not cause complete muscular relaxation.

PENTAL

Pental is a colorless liquid made from fusel oil. It has been used to produce anesthesia for short operations, and it produces no after-effects. Its effects are similar to those of ether or chloroform, but it does not cause much muscular relaxation. It has no effect on the heart or respiration. It occasionally causes twitchings of the muscles, or convulsions, even during anesthesia.

METHYLENE BICHLORIDE

Methylene bichloride is an inflammable, colorless fluid which has an odor like chloroform. Its effects are similar to those of chloroform. It produces rapid anesthesia which soon wears off. It slows and weakens the heart action.

ANESTHETICS

ANESTHETIC MIXTURES

The following preparations are mixtures of various anesthetics. They are said to have various advantages over a single anesthetic.

A. C. E. MIXTURE

This consists of: alcohol 1, ether 2, chloroform 3 parts by volume.

ANESTHOL

This is a mixture of: chloroform 36, ether 47, ethyl chloride 17 per cent.

This mixture is said to have the same boiling point as the blood, and therefore to be easily excreted. The dangers of chloroform are thus said to be avoided.

When these mixtures are given, the ether and the ethyl chloride evaporate more quickly than the chloroform.

The anesthetist is then giving concentrated chloroform, instead of a diluted mixture. Dangerous symptoms are thus more apt to follow, especially in warm weather, since the ether and other ingredients evaporate more easily than the chloroform.

SOMNOFORM

This is a mixture of: ethyl chloride 65, ethyl bromide 5, methyl chloride 30 per cent.

NITROUS OXIDE GAS (LAUGHING GAS)

Nitrous oxide gas is a colorless gas without any odor. It is made by distilling ammonium nitrate. The gas is passed through water, and collected in small metal cylinders, in which it usually comes for practical use. It is the safest and most pleasant anesthetic known.

Appearance of the Patient. Nitrous Oxide Anesthesia.—A few seconds after inhaling nitrous oxide gas, the patient usually feels rushing, drumming or hammering noises in the ears, the sight becomes indistinct, and he has a feeling of warmth and comfort all over the body. The arms and legs move constantly about, the patient is bright, lively, very jolly, and bursts out into fits of laughter (hence the name "laughing gas"). These symptoms last for about 2 or 3 minutes and then the patient feels drowsy, falls asleep, and loses all sensibility.

During the anesthesia, the face is dark red in color, often blue, the breathing is deep and snoring in character, the pulse is slow, strong and tense, and the blood pressure is very high. If the nitrous oxide is judiciously mixed with air, the anesthesia can be kept up for a half to one hour.

ANEURYSM

As soon as the mask is taken away, however, the patient becomes conscious in about 1 to 3 minutes, and has no after-effects, except perhaps a slight headache, which may persist for a few hours.

Nitrous oxide does not relax the muscles, so that prolonged abdominal operations cannot be performed under its anesthesia.

Excretion

Nitrous oxide gas is eliminated from the body in a few minutes by the expired air.

Poisonous Effects

When too much nitrous oxide is given, the following symptoms are produced, because the hemoglobin is unable to obtain its necessary oxygen. The blood is then impure and is poisonous to the brain and other organs of the body.

Symptoms.—1. The face is blue in color.

2. The breathing is difficult and deep.

3. Slow, strong pulse, with very high blood pressure.

4. Convulsions.

These symptoms disappear as soon as the nitrous oxide is stopped.

Administration

Nitrous oxide gas is usually given by inhalation, by means of a specially constructed apparatus, consisting of a mask attached to a large rubber bag, which is filled with the gas from a metal container.

Uses

Nitrous oxide gas is used to produce anesthesia for short surgical operations, and to begin ether anesthesia, so as to avoid its unpleasant symptoms and excitement stage.

It is frequently given together with oxygen for a prolonged anesthesia.

ANESTHETIC MIXTURES

See ANESTHETICS.

ANESTHOL

See ANESTHETICS.

ANEURYSM

Aneurysm is due to a diseased condition of the arteries causing them to bulge where the wall is thin and is accompanied by symptoms of pressure on neighboring structures—the lungs, bronchus, trachea, esophagus (with difficulty in

ANGINA PECTORIS

swallowing), veins, ribs, sternum or spine, etc. Pressure, constant pulsation, and corrosion of bone cause very severe, persistent, boring pain. The danger in aneurysm is sudden death from rupture of the diseased artery.

The **Nursing Care** is to avoid all conditions which will tend to raise the blood pressure or increase the force of the heart-beat.

ANGINA PECTORIS

This is a name given to an attack of acute distress in the chest, which consists of at least three elements, namely, pain, faintness, and a sense of dying.

The patient, usually a man past middle age, under the influence of exertion or excitement, or on meeting a cold wind, is suddenly seized with pain in the chest, which is severe, violent, or even excruciating, and sharp or neuralgic in character; it passes upwards and backwards into the neck and left scapular region, and down the left arm possibly as far as the fingers. Therewith a sense of faintness overspreads the patient; and he feels that the action of the heart is disturbed or arrested, that the chest is oppressed or grasped, and that he is dying. Voluntary movement is arrested; the sufferer stands still or clings to the nearest support; the breathing is feeble or arrested, with a feeling of want of breath; his countenance is pale, anxious, distressed, or imploring; the lips are pallid or livid; the surface is covered with a cold sweat. The pulse varies: it may be regular or irregular, frequent or infrequent; its force is feeble. After a period of a few moments the attack passes off, leaving a sense of relief, but exhaustion and local soreness; or the patient dies in the brief paroxysm. If he recover, the angina returns after an uncertain interval once or more often; ultimately it proves fatal.

ANKLE, STRAPPING OF

To Strap the Ankle.—Strapping is applied to the ankle to support and immobilize a sprained ankle. Before applying the strapping the foot is supported and placed in the proper position, that is, flexion and inversion of the ankle. The patient may hold the ends of a bandage which encircles the ball of the foot in order to maintain this position during the application.

The strapping consists of vertical straps which extend under the foot and up over the ankle and leg on either side. These alternate with horizontal straps which extend around the heel and back of the leg and over the ankle and foot on either side. The width of the straps used is usually one

ANKLE, STRAPPING OF

inch. The length of the horizontal straps may be from twelve to fifteen inches or more, depending upon the length of the foot. The length of the vertical straps depends upon the extent of the strain and the portion of the limb necessary to immobilize.

The method of applying the strapping is determined by the anatomical formation of the ankle joint as the purpose of the application is to immobilize this joint. It is a hinge joint, the chief motion being upward flexion, and extension. It is formed by the astragalus and the external and internal malleoli (commonly called the ankle-bones) which clasp the astragalus on either side. The strength of the ankle joint is due largely to the lateral ligaments attached to these bones and to the many closely associated tendons. In sprains of the ankle it is usually these tendons and ligaments which are strained or lacerated. In strapping the ankle, therefore, the attention should be directed to affording support and limiting the motion about the heel and malleoli.

The center of the first vertical strap should be placed under the foot so that when applied to the leg it will pass directly over the external and internal malleoli on either side. The center of the first horizontal strap should then be placed behind the ankle so that when applied it will pass directly over the malleoli on either side. The horizontal straps should be made to cross on the instep; this gives added support and helps to immobilize the joint. The vertical straps must be applied with downward pressure on the outside of the foot and firm upward pressure on the inside or arch of the foot. The vertical turns applied alternate with the horizontal straps in each case crossing each other in an even line working toward the heel. Each strap overlaps one-third or one-half the preceding one. The straps are continued until in each case the tip of the heel is reached. Horizontal straps may also be applied higher up around the ankle, depending upon the degree of immobilization desired.

The center of a vertical strap should then be placed beneath the sole of the foot near the center of the arch and firm traction made on the upward turn on the inside or arch of the foot to further strengthen the support. Several horizontal straps should also be applied over, above, and below the malleoli to further limit motion. The last strip should be applied directly over the tip of the heel, so that it is completely covered, and carried upward with firm traction so as to cross in front of the ankle. A short strip should cover the ends of the vertical strips to keep them from curling.

ANOCI-ASSOCIATION

ANOCI-ASSOCIATION

See SHOCK.

ANOPHELES

See MOSQUITOES.

ANTHELMINTICS

Anthelmintics are drugs which are principally used to destroy or expel intestinal worms. The drugs which destroy these worms are often called **vermicides**, and those which expel them, **vermifuges**. This difference in their action really depends, however, upon the amount of drug given, and how soon afterwards the bowels are moved. Thus, a large dose of one of the anthelmintics, if it remains in the intestine, will destroy, while a smaller dose will merely expel the worm.

With the exception of pelletierine, which has a specific action on tape worms, most of the anthelmintics do not affect the worms selectively.

All the anthelmintics are poisonous both to the worm and to the patient, but they are very slowly absorbed, so that their poisonous action is manifested mainly on the worm. Occasionally, if they are not followed by a cathartic, the drugs may be absorbed, and poisonous symptoms then result.

The anthelmintics are best classified according to the particular worm for which they are used.

1. **For Tape Worms, or Tæniæ:** Aspidium; Cusso; Pepo; Kamala; Granatum; Pelletierine.

2. **For Round Worms, or Lumbrici:** Santonin; Spigelia; Chenopodium; Azedarach.

3. **For Thread Worms, Seat Worms or Ascarides:** Quassia; Alum; Sodium Chloride; Tannic Acid; Calumba; Lime Water; Vinegar.

4. **For Hook Worms, or Uncinariæ:** Thymol; Naphthol; (Calomel); Chenopodium.

The diagnosis of the form of worm is usually made by finding the characteristic eggs in the stools.

Administration

In giving any of the anthelmintics, it is important that the following routine measures be carefully carried out:

1. The patient should be given a very light diet, a day or two before the drug is administered, or better still, no food should be given for twenty-four hours before.

2. The bowels should be thoroughly moved with a light laxative, the day before administration.

ANTIPHLOGISTIN

3. The drug should best be given early in the morning on an empty stomach.

4. About four to eight hours after the administration, a brisk cathartic such as calomel or castor oil, should be given, to expel the worm. Occasionally a cathartic like calomel is given together with the drug.

No food should be given until the bowels have moved.

ANTHRASOL

This is a colorless coal tar which has been freed from pitch, coloring matter and other substances and is then mixed with juniper tar. It is used as an antiseptic for the skin, to destroy parasites and to soothe the skin. It is usually given in ointments of 5 to 30 per cent. in various skin diseases.

ANTIFEBRIN

See ACETANILID.

ANTIFORMIN

This is a strongly alkaline solution of sodium hypochlorite. It rapidly dissolves the bodies of all bacteria, except the tubercle bacilli. It dissolves all secretions such as sputum and also destroys unpleasant odors. It is therefore a disinfectant, antiseptic and deodorant. It is said to be a stronger disinfectant than carbolic acid. It is also used in testing the sputum and other secretions, for tubercle bacilli. Antiformin is used externally in 2 to 10 per cent. solutions, and as a spray in 1:1000 solutions.

ANTIPHLOGISTIN

Antiphlogistin is a clay-like poultice (cataplasma kaolini) consisting of boric acid, oil of peppermint, methyl salicylate, thymol, glycerin and kaolin, a clay-like substance, consisting of aluminium silicate.

Effects of the Application.—These are due largely to the moist heat. It is said to have less power as a counter-irritant and to retain the heat for a shorter time than a flaxseed poultice.

Conditions in which Antiphlogistin is Commonly Used:

1. In inflammatory diseases of the chest, such as pleurisy and bronchitis. The effects produced are similar to those produced by a flaxseed poultice or mustard paste.

2. In toothache, when applied to the face, the poultice frequently gives great relief.

3. In inflammation of glands and joints to relieve pain and swelling.

Method of Application.—The required amount of anti-

ANTIPYRETICS

phlogistin is placed in a small receptacle, which is then allowed to stand in a basin surrounded by boiling water until the desired temperature is reached. The water is kept boiling until the antiphlogistin is thoroughly heated. It is then spread on muslin or old linen and applied directly to the part. A binder or bandage is used to hold the poultice in place. As the virtue lies chiefly in the heat, the poultice may be covered by flannel and a hot-water bag may be used to increase and retain the heat.

ANTIPYRETICS

Antipyretics are drugs which are used principally to lower the body temperature.

Drugs lower the temperature in three different ways:

1. **By lessening the production of heat.** This is accomplished by such drugs as **quinine, morphine, aconite, etc.**, which lessen the muscular and other activities of the body.

2. **By increasing the elimination of heat.** Drugs like **pilocarpine** or **morphine** which produce sweating, and drugs which widen the blood vessels of the skin, such as the **nitrites**, or the **spirit of nitrous ether**, reduce the temperature in this way.

3. **By setting the heat regulating center for a temperature nearer normal**, so that the excessive heat is eliminated. When the temperature is normal, these drugs produce no effect. The analgesic antipyretics act in this way.

ANALGESIC COAL TAR ANTIPYRETICS

The drugs belonging to the coal tar group were originally used to lower temperature. They are now principally used to relieve nervousness, headache and pain.

Appearance of the Patient

(Antipyrin, Acetanilid, Phenacetin)

About fifteen minutes to half an hour after an average dose of phenacetin is given, the patient is relieved of neuralgic pains or headache from which he may have been suffering. If he has temperature, it may be reduced about three degrees or even to normal in several hours, accompanied by profuse sweating. The pulse and respiration are usually not very much affected. The skin is flushed and may be moist.

Idiosyncrasies

In some individuals, such as those that are anemic, or those weakened by prolonged illness, the following unusual symptoms occasionally occur:

ANTIPYRETICS

1. Skin eruptions: redness and itching, often swelling of the face and eyelids, which may last for several days.
2. Nausea and vomiting.
3. Cyanosis (especially after acetanilid and phenacetin).
4. Collapse.
5. Dizziness.

Many patent headache powders contain coal tar antipyretics, and these frequently produce poisonous effects from continued use.

Poisonous Symptoms

The symptoms of poisoning may follow a single overdose in which case they appear suddenly. Usually, however, they result from the continued use of some patent headache powder for the relief of headache.

Overdoses of analgesic antipyretics cause the following symptoms:

1. Cyanosis (blue color of the face and hands).
2. Shortness of breath.
3. Slow, weak pulse.

The cyanosis is not as marked after antipyrin.

With larger doses, in addition to these symptoms, there may be the following:

4. Subnormal temperature.
5. Muscular twitchings.
6. Collapse.
7. Stupor.

Treatment

Usually, stopping the drug is sufficient. In severe cases the following procedures are carried out:

1. Keep the patient quiet.
2. Wash out the stomach.
3. Give demulcent drinks (oils, acacia, etc.).
4. Give oxygen to relieve the cyanosis.
5. Atropine and other stimulants are given.

Habit Formation

Many nervous patients get into the habit of taking various headache powders for the relief of nervousness and headache. The habit is most pernicious; not only because of the danger of poisonous symptoms developing, but because of the interference with the general health. The nurse should therefore discourage the use of these remedies, and only give them when other milder measures are of no avail. Continued use of the coal tar drugs causes the following symptoms:

ANTIPYRIN

1. Digestive disturbances.
2. Nervousness.
3. Restlessness.
4. Sleeplessness.

The last three symptoms occur especially when the drugs are suddenly discontinued.

Administration

The antipyretics are best given between meals in wine, iced brandy, syrup, or milk.

The coal tar antipyretics or their derivatives should not be given together with caffeine. Sodium bicarbonate, however, does tend to lessen the weakening action on the heart.

And see ANTIPYRIN, ACETANILID, ACETPHENETIDIN, PYRAMIDON, and PHENOCOLL.

ANTIPYRIN

Antipyrin is a white crystalline powder which is readily dissolved in water.

Antipyrin; dose 5 to 20 grains.

Antipyrin Salicylate (Salipyrin); dose 5 to 30 grains.

This is a combination of antipyrin with salicylic acid. It is said to relieve rheumatic pains more efficiently than either of its constituents alone.

See ANTIPYRETICS.

ANTIRABIC VACCINE

This is an emulsion of the spinal cords of rabbits which have been inoculated with rabies (hydrophobia) poison. After the animals have been inoculated, they are killed and their spinal cords removed. The cords are dried, ground and made into an emulsion in normal salt solution. This emulsion is used in the treatment and prevention of hydrophobia. The treatment is begun with the injection of a weak emulsion of a cord which has been dried for a long time, and is followed by the injection of stronger emulsions (containing cords which have been dried for a shorter time.)

ANTITOXIC SERUMS

See SERUMS.

APERIENTS

See CATHARTICS.

APHASIA

Aphasia is a term which is applied to certain disturbances of function in the cerebral centers which have to do with language. These disorders are the result usually of some

APOMORPHINE

lesion which either interferes with or destroys the function of those centers where impressions of written and spoken words and their expression are stored in memory, and may be either sensory or motor.

Sensory aphasia is shown by inability to comprehend spoken and written words. The patient can hear and can see, but does not understand. He is like one who hears a foreign language which is unfamiliar, or looks at symbols whose meanings are unknown; he cannot understand because there are no images in memory which correspond to what he hears and sees, and so he cannot interpret them. The ability to recognize objects or recall their uses may also be lost. This disorder is not uncommon among the aged, and articles and objects of everyday familiarity are sometimes put to most unusual and unsuitable uses.

Motor aphasia is shown by inability to speak or to write words with which one has been familiar. The patient knows well what he wants to say or to write and recognizes the word when it is suggested to him, but because the memory of muscular control and coördination required to speak or to write the words is lost, he cannot express them. He has been likened to a banker who wants to open his safe and has lost the combination.

APIOL

Apiol is an oily liquid obtained from the root of ordinary garden parsley or *Apium petrosinellum*. It resembles camphor and is often called parsley camphor.

Apiol is used to increase the menstrual flow, especially when the scanty menstruation is due to anemia and when the menstruation is painful. The dose is from three to ten grains.

Apiol is given in capsules; most of which are imported from France. Each capsule contain four grains. There are a number of preparations of apiol combined with ergot and other substances.

APOMORPHINE

Apomorphine is an artificial alkaloid, made from morphine, one of the alkaloids of opium.

Appearance of the Patient

When a moderate dose of apomorphine is administered hypodermically, within ten to fifteen minutes after it is given the patient feels nauseated and vomits profusely. At the same time, there is a profuse secretion of tears, of mucus from the nose and bronchi, and the skin is covered with cold

APOPLEXY

perspiration. These symptoms are always produced by any drug which causes vomiting. There is usually a great deal of weakness after apomorphine is administered, at times very profound collapse: a rapid, thready pulse, slow and shallow respiration, cold perspiration and dilated pupils. The collapse has seldom been fatal, however.

Internal action: Small doses often increase the secretions of all the mucous membranes without producing vomiting, and they are often given for this effect.

Mode of action: Apomorphine produces vomiting, by causing the vomiting center in the brain to send impulses to the stomach to cause its muscle wall to contract and thereby expel its contents.

Excretion: It is excreted by the stomach in the vomited matter.

It is given as apomorphine hydrochloride; and the dose as an emetic is $\frac{1}{10}$ to $\frac{1}{5}$ grain; as an expectorant $\frac{1}{30}$ to $\frac{1}{15}$ grain.

Apomorphine is usually given hypodermically.

APOPLEXY

The Symptoms.—The patient may have a few minutes' warning—headache, dizziness, ringing in the ears, specks before the eyes—but the attack usually occurs without warning.

“In the typical apoplectic attack the condition is as follows: There is deep unconsciousness; the patient can not be roused. The face is injected, sometimes cyanotic, or of an ashen-gray hue. The pupils vary; usually they are dilated, sometimes unequal, and always, in deep coma, inactive. If the hemorrhage be so located that it can irritate the nucleus of the third nerve the pupils are contracted (hemorrhages into the pons or ventricles). The respirations are slow, noisy, and accompanied with stertor. Sometimes the Cheyne-Stokes rhythm may be present. The chest movements on the paralyzed side may be restricted, in rare instances on the opposite side. The cheeks are often blown out during expiration, with spluttering of the lips, the pulse is usually full, slow, and of increased tension. The temperature may be normal, but is often found subnormal, and, as in a case reported by Bastian, may sink below 95° . In cases of basal hemorrhages the temperature, on the other hand, may be high. The urine and feces are usually passed involuntarily. Convulsions are not common.” (Osler.)

Apoplexy and acute alcoholism are frequently confused. The following table (Hare) differentiates them:

APOTHECARIES SYSTEM

ALCOHOLISM	APOPLEXY
Pulse rapid, compressible and weak.	Pulse apt to be strong and slow.
Skin moist, or relaxed and cool.	Skin hot and dry.
Body temperature lowered.	Body temperature raised.
Pupils equally contracted or dilated; generally dilated.	Pupils unequal.
No hemiplegia.	Hemiplegia, one side moved, the other remaining motionless.
Breathing not so stertorous nor so one-sided in lips.	Respiration stertorous, the lips being inflated on one side on expiration.
No facial palsy.	Facial palsy.
Unconsciousness may not be complete.	Unconsciousness complete.

"The odor of alcohol in the breath is no guide, as acute alcoholism may have caused the rupture of a cerebral blood vessel."

The Treatment.—(Dr. Hare).—The patient should be put to bed, in the recumbent position, with the head slightly elevated, the feet low. He should be kept absolutely quiet. An ice-cap or ice compresses should be applied to the head. Hot-water bottles should be applied around the body; a hot mustard foot bath may be given in some cases, to lessen the blood congestion in the head. Drastic cathartics are usually given to relieve cerebral engorgement. When vomiting occurs, the patient must be watched closely, as the stertorous breathing may draw in the half-ejected vomitus to the lungs. No stimulants are given.

Later, when bleeding is checked and there is no danger of further bleeding, potassium iodide is frequently given to cause absorption of the exudate. After all inflammation has subsided, passive exercise, rubbing and massage are given to restore or prevent the wasting of the muscles of the extremities. Strychnine is also given to stimulate the spinal cord and reflexes, and to tone up the muscles.

The *diet* must be carefully selected. Meats are excluded or given sparingly; no wines are given as they tend to cause cerebral congestion and a second rupture.

The *bowels* must be kept open.

APOTHECARIES SYSTEM

See WEIGHTS AND MEASURES.

APPENDICITIS

APPENDICITIS, NURSING IN

The diagnosis confirmed, the nurse's part in the preparation for the removal of an appendix consists of; shaving the local field; obtaining a urine specimen; allowing no food after supper; and giving an enema the morning of operation. In most cases a glass of lemonade may be given a few hours before the operation, for this not only is refreshing, but also is supposed to aid in the diminution of the formation of mucus during the administration of the anesthetic.

If the type of operation permits, the patient is placed on his side to render vomiting less dangerous. If the condition requires drainage the patient is placed in Fowler's position and the pulse and respiration are watched every ten minutes until the patient is conscious. At stated intervals normal salt solution is given to supply the necessary body fluid and to give a general systemic influence.

The patient's comfort depends on: Frequent changing of position; the placement of pillows under the knees; protection against draughts; the proper functioning of the bladder; the alleviation of thirst; the relief from distention by the use of the rectal tube; and the protection against surgical infection. If pain persists, the nurse administers the sedative ordered so that the patient's strength will be conserved and exhaustion prevented.

AQUA FORTIS

See NITRIC ACID.

AQUA REGIA

See NITROHYDROCHLORIC ACID.

ARAROA

See CHRYSAROBIN.

ARBUTIN

See UVA URSI, and CHIMAPHILA.

ARGENTUM

See SILVER.

ARGYLL-ROBERTSON PUPIL

This is a condition in which the pupil of the eye reacts to accommodation, but does not react to light. This reflex should be tested in a good light. The condition is found in tabes dorsalis, general paralysis of the insane; syphilis of the brain, congenital syphilis, alcoholism, and some other conditions.

ARSENIC

ARGYRIA

Argyria is a condition which results from prolonged use of silver salts, but the condition is not very common at the present time.

The silver salts are absorbed into the blood, and deposited in the various tissues of the body. Since silver salts turn a dark color on exposure to light, the skin turns a dark gray or slate color. The skin of the entire body or only various regions of it, such as the face or the gums, may be thus affected.

To relieve the condition potassium iodide is usually given, but the results are not marked.

ARGYROL

Argyrol is a compound of silver oxide and proteins, containing 20 to 25 per cent. of silver.

It is used locally as an antiseptic and astringent to mucous membranes, in 10 to 25 per cent. solutions; these are not injurious to the tissues. Argyrol should be very carefully used, as it stains linen a dark brown color.

ARISTOL

Aristol Thymol Iodide is a yellowish brown powder which is used like iodoform but it has a more pleasant odor.

See IODOFORM.

ARSENIC

When small doses of arsenic are given for some time, the patient feels better, stronger and is more active. He looks more robust, somewhat stouter and has a ruddier color. The appetite is better and the bowels move more often. The pulse is stronger, somewhat faster and the patient breathes somewhat deeper. In short, the patient feels better and stronger.

Local Action: Applied to the skin, arsenic causes inflammation and pain. If it is allowed to remain on the skin for a longer time, the skin is destroyed and an ulcer remains (escharotic or caustic action). Arsenic is slightly antiseptic. It is easily absorbed from the injured skin. On **mucous membranes**, when applied locally, it also causes redness and pain, with subsequent inflammation and destruction of the tissues.

Internal Action.—In the mouth, arsenic has a sweetish taste, causes redness of the lining membrane of the mouth, and increases the flow of saliva.

In the stomach it causes a sense of heat, it increases the appetite and the secretion.

ARSENIC

In the intestines, it increases the secretion of the mucous membrane, and the peristalsis, thus causing movements of the bowels.

Action after Absorption

Arsenic is rapidly absorbed and it affects principally the blood and the tissues.

Action on the Blood: Arsenic increases the number of red blood corpuscles by increasing their formation in the bone marrow. Since the red blood corpuscles in the blood are increased, they are able to carry more nourishment and more oxygen to the organs and tissues of the body, and to remove more waste products. Thus they increase the activity of all the organs of the body in the same way as iron does.

Action on the Tissues: Arsenic prevents the tissues from being used up, by lessening their combination with oxygen. It therefore increases the growth and nutrition of the tissues and organs of the body. As a result of this action, if arsenic is taken for some time, the patient usually becomes somewhat stouter.

Action on the Circulation: In the doses that arsenic is usually given, it makes the heart beat somewhat stronger, though the rate of the pulse is not much affected. This is the result of the improvement in the general condition.

Action on the Respiration: By improving the general condition of the patient, the breathing is deeper and faster, the patient takes in more air, and therefore more oxygen for the larger number of corpuscles which the blood contains.

Action on the Brain and Spinal Cord: The brain and spinal cord are somewhat more active, when arsenic is given for some time, because of the improvement of the general health.

Excretion

Arsenic is excreted mainly by the urine, also by the lining membrane of the stomach, intestines and bronchi. It is excreted very slowly and may therefore cause cumulative symptoms.

Tolerance

When arsenic is taken regularly in small quantities, the patients are able to take comparatively large quantities of the drug without getting poisonous effects. A patient is then said to have a **tolerance** for arsenic. This is due to lessened absorption which occurs from continued use.

Women very often take arsenic for weeks or months at a time to improve their complexion and figure. Poisonous symptoms often occur as a result of such use.

ARSENIC

Uses

Arsenic is used principally in **anemia**, to improve the condition of the blood. It is used especially in those forms of anemia in which the number of the corpuscles is diminished. It is often given together with iron.

Arsenic is also given for chorea (St. Vitus' dance), and as a tonic, to improve the general condition of the patient. Some of the newer preparations of arsenic are given as a specific for syphilis.

Acute Arsenic Poisoning

This follows a single large dose of arsenic taken with suicidal intent or by mistake. Many rat and insect poisons contain large quantities of arsenic.

Symptoms.—The following are the symptoms which occur in about fifteen minutes to an hour:

1. Burning pain in the esophagus and stomach.
2. Profuse nausea and vomiting of bile stained serum containing small flakes of mucous membrane.
3. Severe abdominal cramps.
4. Profuse diarrhea, with watery, bloody stools containing small flakes of mucous membrane (rice water stools).
5. Excessive thirst (due to loss of fluid).
6. Scanty, bloody urine.
7. Collapse: cold, moist skin, slow and shallow breathing, rapid, thready pulse, etc.
8. Coma and convulsions may occur before death, which results in from six hours to two days.

In some cases there may not be much nausea, vomiting or diarrhea. The patient suddenly goes into collapse, has a few convulsions and dies.

If the patient recovers from the acute symptoms, paralysis of the muscles of the extremities may result, causing "drop feet" or "drop hands," from which he usually recovers, however.

Treatment.—1. Give iron hydroxide or iron hydroxide with magnesia until recovery. (See IRON.)

2. Wash out the stomach, thereby removing the compound of iron and arsenic. Induce vomiting if no stomach tube is at hand.

3. Protect the mucous membrane of the stomach and the intestines by giving mucilaginous drinks such as milk, olive oil, etc.

4. Give plenty of water.

5. Later, bismuth, chalk or opium may be given for the diarrhea.

6. Abdominal cramps are usually relieved by a hot water bag and by atropine.

ARSENIC

7. The collapse is usually treated with caffeine, atropine, strychnine, warm applications, etc.

Cumulative Arsenic Poisoning

Since arsenic is excreted much slower than it is absorbed, cumulative symptoms, or chronic arsenic poisoning is very common. It usually occurs from the continued medicinal use of arsenic preparations. It may also result from inhaling fumes of arsenic, in rooms papered with wall paper containing arsenic dyes, from wearing clothing dyed with arsenic, or by eating food colored with arsenic dyes. The following symptoms, in the order of their onset, are noticed after prolonged administration. Often the later symptoms appear before the earlier ones.

Symptoms.—1. Itching of the eyelids.

2. Redness of the conjunctiva of the eye.

3. Puffiness about the eyes, especially in the morning.

4. Sneezing, "running nose" (coryza).

5. Tightness in the throat.

6. Hoarseness.

7. Loss of appetite, heaviness in the stomach, nausea and vomiting.

8. Skin eruptions: red spots, areas of brownish discoloration (very often they look like freckles) on the face or the abdomen. Dark discolorations on the skin of the abdomen, which look like pencil marks.

In severe cases, the hair and nails may fall off.

9. Cramp-like abdominal pains.

10. Diarrhea, with "rice water" stools; the rice water appearance of the stools is due to small flakes of the lining membrane of the intestines which they contain.

The following symptoms appear later and only in severe cases:

11. Persistent headache.

12. Pains around the knee, ankle, foot and hands.

13. Redness and swelling of the hands and feet.

14. Areas of skin, especially on the extremities, which are very sensitive to touch, to pain, to heat and cold.

15. In severe cases there are paralyses of the extensor muscles of the hands and feet, resulting in "drop feet" and "drop hands."

Treatment of Chronic Arsenic Poisoning

If the arsenic is stopped and cathartics given, the symptoms usually gradually disappear. The paralyses must be treated by massage and electricity, until the muscles recover; which they usually do.

ARSENOBENZOL

Preparations

Solution of Potassium Arsenite (Fowler's solution); dose one to eight minims.

This contains 1 per cent. of arsenic trioxide, potassium bicarbonate and tincture of lavender.

Five minims of Fowler's solution contain $\frac{1}{20}$ grain of arsenic trioxide.

Solution of Sodium Arsenite (Pearson's solution); dose 1 to 8 minims.

Solution of Arsenious Acid; dose 1 to 8 minims.

This contains 1 per cent. of arsenic trioxide and dilute hydrochloric acid.

Solution of Arsenious and Mercuric Iodides (Donovan's solution); dose 5 to 20 minims.

This is the strongest arsenic preparation. It contains 1 per cent. each of arsenic iodide and of red mercuric iodide. It may cause symptoms of mercury poisoning.

Arsenic Trioxide; dose $\frac{1}{60}$ to $\frac{1}{12}$ grain.

Sodium Arsenate; dose $\frac{1}{60}$ to $\frac{1}{12}$ grain.

Arsenic Iodide; dose $\frac{1}{20}$ to $\frac{1}{6}$ grain.

Sodium Cacodylate; dose $\frac{1}{4}$ to 1 grain.

This is a compound of cacodylic acid, which is a compound of arsenic. It is given hypodermically and is said to cause no unpleasant symptoms.

Soamin.—This is sodium arsanilate, and contains 22 per cent. of arsenic. It usually comes in tablets each containing 1 to 5 grains of soamin.

Salvarsan "606"; dose 5 to 10 grains.

Neosalvarsan; dose 5 to 10 grains.

These are organic compounds of arsenic which are used as specifics for syphilis. They are given intravenously, as an intravenous infusion, or by deep injection into the muscles. Salvarsan has to be very carefully neutralized with an alkali. Both preparations come in closed glass tubes, containing nitrogen gas and the powder.

Atoxyl

This is Sodium Arsanilate, and comes in tablets of half a grain for hypodermic use.

Administration

Arsenic preparations should be given well diluted in a large glass of milk after meals.

ARSENOBENZOL

See SALVARSAN, and ARSENIC (SALVARSAN).

ARSPHENAMINE

ARSPHENAMINE

See SALVARSAN.

ARTERIOSCLEROSIS

Arteriosclerosis may be (1) either the effect or the cause of high blood pressure; (2) the effect of poisons in the blood, as in syphilis, typhoid, Bright's disease, diabetes, gout, or constipation, etc., or (3) the effect of senile decay—the blood pressure is normally increased with old age. Strain, mental, physical or nervous, increases the tendency to arteriosclerosis or “hardening of the arteries.”

The **Nursing Care and Treatment** aim to avoid, as far as possible, conditions which aggravate the disease and cause contraction of the arteries or increased blood pressure. All excesses in exercise, food, drink, and habits should be avoided. The functions of the skin, the kidneys and bowels should be carefully regulated by warm baths, drinking water freely, and the avoidance of constipation. Exposure to cold contracts the blood vessels and should be avoided by regulation of the clothing, by warmth to the extremities, and hot drinks to relax the blood vessels. Old people in particular stand exposure to cold badly—cold air, baths, or being deprived of their customary clothing and surroundings. When not allowed to wear flannel underwear in bed they should have extra blankets or a hot-water bag and frequent massage to the limbs to restore the circulation and prevent cold and cramps, etc. When the arteries of the brain are affected, the danger of apoplexy must always be remembered. All causes of worry, excitement, anger or irritation must be avoided, as they greatly increase the supply of blood and the blood pressure in the brain, shown by the flushed face and prominent blood vessels. Slight, petty causes of irritation particularly upset the patient. The same is true in angina pectoris. Particular care should be taken to observe moderation in food, drink and exercise and to avoid constipation or foods which cause distention. Sudden death frequently occurs from “acute indigestion” combined with some unusual exertion and strain on the heart. Nitroglycerin or amyl nitrite is usually ordered to dilate the blood vessels, and bromides or morphine to relieve the pain and to quiet and relieve the patient from the fear of impending death.

ARTICULATIONS

See JOINTS.

ARTIFICIAL FEEDING

See INFANT FEEDING

ASAFETIDA

ARTIFICIAL RESPIRATION

Schaefer's method is the best. This has been described as follows: "The patient is placed on the ground, with his face downward, and with a thick folded garment or pillow under the lower part of the chest. Care must be taken that the entrance to the mouth and nose is clear. The operator places himself in a kneeling posture astride of the patient, facing the patient's head, his knees being opposite the patient's hips. He then places his hands flat over the back of the lower ribs, one hand on each side, and gradually throws the weight of his body forward, so as to make firm pressure on the lower ribs. By this means the chest is compressed and air is forced out of the lungs. The operator then brings his own body up into the semi-erect position, but still retaining his hands in position, thereby relaxing the pressure on the ribs, and enabling air to be drawn into the lungs by the elastic reaction of the chest wall. The process is repeated regularly about 15 times a minute, and should be continued for at least half an hour."

ASAFETIDA

This is a gum resin obtained by incising the root of the **Ferula narthex**. It consists of a gum resin and a volatile oil which is the active principle. Asafetida is frequently used in India as a condiment.

Action.—In the mouth: It has a very unpleasant nauseous taste, and an odor resembling garlic.

In the stomach: It checks the formation and aids the expulsion of gas (carminative action), and it increases the secretions.

In the intestines: It increases the secretions and peristalsis and helps to expel gas. It causes frequent movement of the bowels.

It is used principally to remove gas from the intestines. It is frequently given in an enema.

Because of its unpleasant taste, which causes a psychical effect, it is occasionally given to quiet hysterical patients.

Preparations

Emulsion of Asafetida; dose 4 to 8 drams.

This is given by mouth, or in an enema; to relieve distention.

Tincture of Asafetida; dose 15 to 30 minims.

Pills of Asafetida; dose 1 to 3 pills.

Each pill contains 3 grains of asafetida.

ASPHYXIA

Asphyxia is a condition of unconsciousness due to suffocation or interference of any kind with the oxygenation of the blood.

The *causes* of asphyxia may be:—

1. Mechanical interference with the entrance of air to the lungs which may be (1) inflammation and swelling of the throat and larynx or the formation of a membrane as in diphtheria; (2) edema of the glottis in diphtheria, tuberculous laryngitis, cardiac and renal diseases; (3) foreign bodies in the respiratory tract; (4) pressure on the trachea or bronchi from goitre, tumor or aneurysm; (5) water and mucus, etc., in the respiratory tract as in drowning.

2. The inhalation of smoke, or poisonous gases such as coal gas or illuminating gas, or the fumes of ammonia, or nitric acid, or the inhalation of ether in a general anesthetic.

3. Interference with the interchange of gases between the blood and air in the lungs as in diseases of the heart or lungs, and in poisoning from carbon monoxide in which the hemoglobin is saturated with the gas and cannot combine with oxygen.

4. Weakness of the respiratory muscles, or convulsive spasms as in croup or whooping-cough, or paralysis as in diseases or injuries involving the upper part of the spinal cord.

5. Weakness of the respiratory center in the medulla.

6. Failure of the lungs to expand in the new-born.

The *Symptoms* of asphyxia develop in three stages: In the *first stage*, the breathing is more rapid, labored, and distinctly audible. Respiratory muscles not used in quiet breathing are forced into action. The appearance of the patient is alarming—the lips are blue, the face congested, the eyes prominent and bloodshot and the expression is anxious. This stage lasts about one minute.

The *second stage* is the stage of convulsions. This stage lasts less than one minute.

The *third stage* is the stage of exhaustion. The patient becomes unconscious, the muscles flaccid and the pupils widely dilated. The pulse is almost imperceptible, due to heart failure. The inspirations are prolonged and sighing and the intervals between increase until breathing finally ceases. Death results from gradual exhaustion and paralysis of the centers in the medulla. The third stage may last three minutes or more.

The *Treatment*.—The first step is to remove, if possible, any obstruction to the free passage of air. If the obstruction is due to fluid in the lungs and bronchi, as in drowning, the

ASPHYXIA NEONATORUM

patient's clothing should be loosened about the neck, chest, and waist, and he should then be turned on his face, and his body raised at the waist-line by means of a folded blanket or clothing. Pressure should then be applied, with both hands spread out, upon the lower chest wall to expel water from the stomach and lungs, and to allow it to run out by gravity from the trachea and mouth. The nose, mouth and throat should be cleansed of mucus.

In all cases of asphyxia, the treatment consists in removing anything which might interfere with breathing, in establishing natural respiration with the least possible delay, and in treating the patient for shock. He should be kept warm and should have plenty of fresh air. His clothing should be loosened about the throat, chest, and waist, and his position must be such as to keep the air passages wide open for the admission of air, and to allow for the free expansion of the lungs. Foreign bodies (such as false teeth) or mucus should be removed from the mouth or throat. Artificial respiration should be begun without delay. See ARTIFICIAL RESPIRATION.

ASPHYXIA NEONATORUM

In this condition the infant is born in a state of suspended animation—its heart continues to beat, but it makes no effort to breathe or to move. "Still-birth" is therefore not the same thing as the child's being born dead, although death may supervene if prompt treatment is not applied. The term *asphyxia* strictly means *pulselessness*, and *apnea* is more correct as meaning *absence of breathing*.

Causes interfering with the circulation of maternal blood through the placenta are (1) *Premature Separation of the Placenta* (accidental hemorrhage or placenta prævia); and occasionally (2) *Tonic Contraction of the Uterus*, which stops all placental circulation.

Causes interfering with the circulation of the fetal blood through the placenta are (3) *Pressure upon the Cord*, as in breech delivery, or prolapse of the cord, or due to knots or tight coiling of the cord round the trunk or limbs.

Other causes of asphyxia are (4) *Premature Efforts to Breathe*, stimulated by the cold air playing on the surface of the body in breech delivery while the head is still in the vagina. This results in the child sucking in mucus and liquor amnii from the vagina, and it may be drowned if not speedily delivered.

(5) Severe *injuries or compression of the fetal head*, due to its passage through a narrow pelvis or the use of instruments, may so damage the respiratory center in the brain that the child makes no effort to breathe after its birth.

ASPHYXIA NEONATORUM

Indirectly, therefore, the causes of asphyxia are manifold, and it may be associated with any form of delayed or abnormal labor, and any form of fetal disease or abnormality.

Varieties.—There are two outstanding varieties named according to the appearance of the child—the Livid or Cyanotic, and the Pallid or White. Many cases are intermediate between these two forms, and the livid form gradually passes into the pallid if not effectually and promptly treated.

(1) *Asphyxia Livida*.—This is much the more common type. The child when born is of a cyanotic blue appearance, the heart and cord beating slowly but often quite strongly, the cord full and thick, the muscles firm and tonic, the reflexes present.

(2) *Asphyxia Pallida*.—In this rarer form the child is deadly white, the heart and cord beating feebly or perhaps imperceptibly, the cord empty and flabby, the muscles (including the sphincters) limp and relaxed, and the reflexes lost.

Prognosis.—In asphyxia livida the prognosis is uniformly favorable, recovery being the rule if the case is properly treated. In asphyxia pallida, on the other hand, the outlook is not good, as the cause is often more serious. Even after recovery many children die of aspiration pneumonia, etc., within a few days.

Treatment.—*Livid or Cyanotic Form.*—As long as the cord is beating strongly the child is obtaining oxygen through the placenta, therefore there is no immediate hurry to tie the cord. Hold the child up by the heels, and with the little finger covered with a small linen swab clear out the mucus from the throat and nose. A catheter may be used for this purpose, the mucus being sucked up. Once the throat is cleared we may stimulate the child to breathe, but it is a mistake to do this before clearing the throat, as the first breath would suck the mucus deeper into the bronchial tubes.

A few gentle slaps on the buttocks and back, light friction over the chest, sprinkling with a few drops of cold water, usually suffice to start the child breathing and crying healthily. If, when the cord is being tied, the child is still blue, cut the cord and allow half an ounce or so of blood to escape before ligaturing.

If this treatment fails, the condition becomes more grave, and requires to be treated like an asphyxia pallida. Indeed, persistent cases of cyanotic asphyxia tend to pass into the pallid form, the surface of the body gradually changing from purple to white as the condition becomes more serious.

Asphyxia Pallida.—When the cord is pulsating feebly or not at all, the placenta is out of action, and therefore the cord should be cut at once to facilitate the manipulation of

ASPHYXIA NEONATORUM

the child. To save time only one ligature need be applied. Hold the child up by the heels and clear out the throat as before. Then immerse the trunk and limbs in a bath of water that is comfortably hot to the hand. Apply light friction over the heart, splash the chest front and back with a few drops of cold water, and every few seconds gently compress the chest with the hand. Clear out the throat from time to time if necessary. If these measures fail, and the heart is still beating no matter how slowly, persevere in the resuscitation. Dry the child with a warm towel, and apply one of the methods of artificial respiration. Of these the best is direct mouth-to-mouth insufflation, as described in the next paragraph. Try this for a few moments. Then replace the infant in the warm bath, for it is a first essential to keep up the body heat. Again apply friction to the chest, clear out the throat, and feel whether the heart is beating. If it is beating, repeat one or other process of artificial respiration and warm bathing alternately as long as the heart continues to beat. When the child revives, keep it warm and have it carefully watched for some time lest it should relapse.

Methods of Artificial Respiration.—*Direct Insufflation.*—Blowing air directly into the lungs is frequently the most effective of all methods, as it forcibly opens up the glottis and the air vesicles of the lungs.

The method may be carried out without any apparatus as follows: Lay the child on its back on a table, and place a clean, fine linen handkerchief over its mouth. Place the one hand over its epigastrium and with the other close its nostrils. Then, taking two or three long breaths so as to empty the lungs of carbonic acid, place the mouth over the child's mouth and breathe into it. The hand over the epigastrium prevents the air passing into the stomach and perhaps rupturing it, while the other hand prevents the air passing out through the nose. The hand on the epigastrium also feels when the chest is full, and when this is so, the chest is gently compressed and emptied. This maneuver is repeated a dozen to eighteen times a minute. The blowing must be gently done, otherwise the air vesicles may be ruptured.

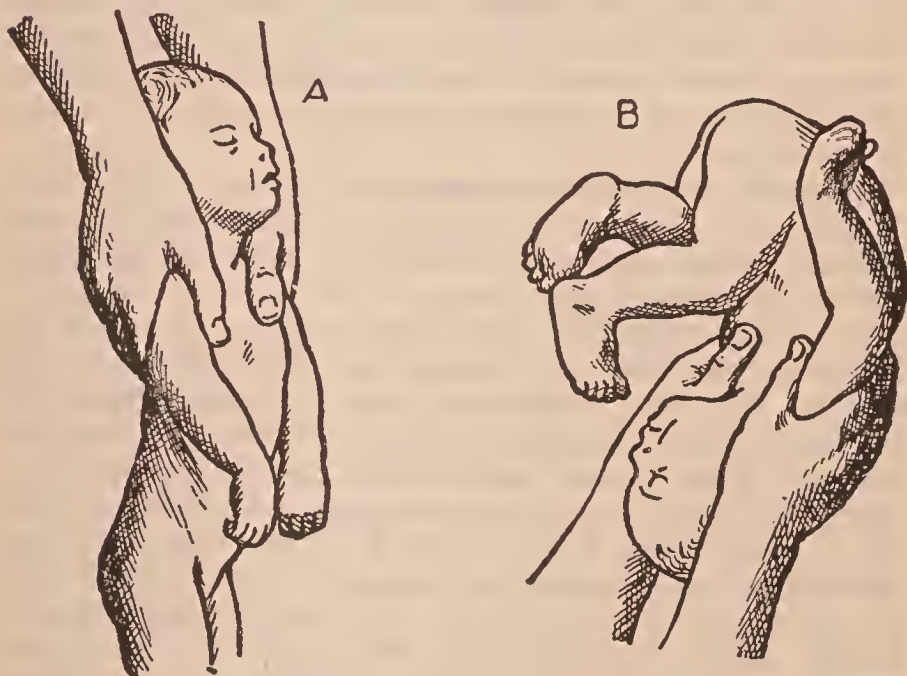
Schultze's Method.—Dry the child and wrap it in a small warm towel to prevent it slipping out of the fingers. Hold the child, head up, grasping it by placing the fingers over the back and sides of the chest, the thumbs and forefingers encircling the axillæ. Steady the child's head between the wrists. Stand with the feet apart, and hold the child hanging down between the legs. See that you have a firm grasp of it. Then swing the child gently up to the level of your face.

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At the end of this swing draw the arms in towards you a little, at the same time dropping them slightly. This causes the lower limbs of the child to fall over in front of the chest. At the same time compress the chest gently with the fingers. Then reverse the movement and swing the child down between your legs once more. Pause for a moment and then repeat. The double movement should be carried out at the rate of about twelve to eighteen times in the minute, but, as mentioned before, not more than six to eight swings should be done at a time.

When the child is hanging down, it is in the position of inspiration. When its limbs fall over in front of the abdomen at the top of the swing, their weight compresses the chest and causes a mechanical expiration.

This method is a good one when carefully done, but it



Schultze's Method of Artificial Respiration.

A. Inspiration. B. Expiration.

is very open to abuse. The not inconsiderable risks of it are—

(1) Violent and careless swinging may cause rupture of the liver, or hemorrhage into the other abdominal organs.

(2) The child may slip out of the hands and be flung on the floor. This is due to not making sure that you have a firm grasp before you start to swing. The intervention of a small warm towel between the hands and the child's body is a help in preventing this accident.

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(3) Fractures of various bones have followed careless swinging.

(4) The child's body becomes rapidly cooled. The warm towel helps to prevent this, and the frequent plunging into a warm bath after every six swings or so.

Rhythmic Traction on the Tongue is sometimes effective. The child is laid on its back and the tongue grasped with the fingers covered by a piece of linen, and pulled outwards twenty to thirty times per minute.

ASPIDIUM

See MALE FERN.

ASPIRATION OF CHEST

See THORACIC ASPIRATION.

ASPIRIN

See SALICYLIC ACID.

ASTIGMATISM

See ACCOMMODATION.

ATOPHAN

Atophan is a white, crystalline substance which is made chemically from various other complex substances.

Atophan has a specific action in acute gout. **It relieves the pains around the joints very promptly.** It increases the secretion of urine and the amount of uric acid contained in it. Beneficial effects have also been obtained from its use in other chronic joint affections, such as rheumatism, etc.

It is not a poisonous drug, and is therefore safer than colchicum.

Preparations

Atophan; dose 8 to 15 grains.

Novatophan; dose 8 to 15 grains.

Paratophan; dose 8 to 15 grains.

ATOXYL

See ARSENIC.

ATROPINE

See BELLADONNA.

AURA

See EPILEPSY.

AUTOINTOXICATION (POST-OPERATIVE)

Antointoxication is closely allied to tympanites. The patient absorbs certain products of fermentation and decompo-

AUTOINTOXICATION

sition from the gastro-intestinal tract, resulting in a slight degree of temperature usually associated with headache and general malaise. This is ordinarily relieved by a movement of the bowels, procured by an enema, and a cathartic. This condition is never very serious, and never alarming. See TYMPANITES.

AZEDARACH

Azedarach is the bark of the root of *Melia azedarach*, an Eastern plant.

It is used in the South as a remedy for round worms. It is usually given as a decoction, made from two ounces of the plant to a half pint of water, of which half an ounce is given every two hours. It is said to produce the same poisonous effects as spigelia. See ANTHELMINTICS.

B

BABY, FIRST ATTENTION TO

See LABOR, MANAGEMENT OF.

BACILLARY DYSENTERY

See DYSENTERY.

BACTERIAL VACCINES

See VACCINES.

BACTERIOLYTIC SERUMS

See SERUMS.

BAKING

Baking is used as a therapeutic measure in (1) inflammatory joints due to rheumatism; (2) inflammatory muscles; (3) chronic inflammation of joints with an exudate; (4) gonorrheal arthritis; (5) gout.

Baking is **contra-indicated** in acute rheumatic fever or in any febrile condition, in acute inflammatory conditions, and in cases in which the skin of the part is broken or diseased.

Effects of Baking.—The local application of hot air usually brings great relief and comfort to the suffering patient. It increases the temperature of the part because the hot air surrounding it prevents the loss of heat. The tendons, ligaments, and fascia are softened and expanded; the muscles are relaxed; pain is relieved, stiffness is removed, and the function of the part is restored.

The Apparatus.—There are several forms of apparatus on the market, so that the method of baking the part will depend upon the form of apparatus used and also upon the part of the body to be baked. These chambers are metal boxes lined with asbestos and containing an asbestos board or rest for the arm or limb. A thermometer is suspended in the chamber.

The *temperature* of the air varies from 200° F. to 300° F.

The *duration* of the treatment varies. It may be resorted to daily or several times a week and each treatment may

BALLOTTEMENT

last from a few minutes to several hours (usually one hour), depending upon the temperature used, the sensations of the patient and the nature of the case under treatment.

Method of Procedure.—First see that the room is warm and that the patient is protected from chilling before, during, and after the treatment. The patient must be undressed (having on a gown, wrapper, stockings and slippers) for the treatment, as it causes general profuse perspiration. Several blankets should be used to protect him from getting cold. His position and the position of the part being baked should be made comfortable and all straining of muscles from a cramped position avoided. Cold applications should be applied to the head before, and during the treatment.

The asbestos board or rest (which becomes very hot) should be covered by a pad of linen. The arm or limb must be protected by a properly fitting flannel covering and not allowed to come in contact with either the asbestos or metal. No rings should be worn by the patient and no pins used in the protector as all metals are good conductors of heat and would burn the patient. The asbestos covering which guards the opening and a blanket should be snugly drawn around the limb. The temperature of the bath must be raised gradually. Both the temperature and the duration of the treatment may be increased from day to day as the patient becomes adjusted to it. The patient should never be left alone and should be watched closely for signs of weakness. He should be encouraged to drink fluids before and during the bath in order to encourage the elimination of waste products and to prevent the body tissues from suffering owing to the loss of so much water.

At the end of the bath the limb should be well wrapped up with wool, covered with rubber cloth, and flannel, to continue the effect of the bath. Some doctors advise that the whole body have a short cold application such as a cold towel rub, followed by careful drying and thorough rubbing. If the affected part will bear rubbing, some doctors also advise a very brief (four to thirty seconds) dry cold application (wring towel very dry before applying) followed by drying and vigorous rubbing. This acts as a tonic to the passively dilated blood-vessels, and prolongs the effects of the bath. In some cases the patient is put to bed between blankets, dried and given an alcohol rub. Because of the free perspiration and weakening effect of the treatment the patient should always rest in bed following it.

BALLOTTEMENT

Ballottement is a French word meaning the tossing of a ball, and is applied to a method of examination by which

BALSAM OF TOLU

the fetus is moved passively inside the uterus. Ballottement is performed as follows. The woman is placed on her back with the head and shoulders slightly raised on pillows. Two fingers are introduced into the vagina and placed in front of the cervix, where the firm head of the fetus may generally be felt resting. The other hand is placed firmly on the fundus of the uterus. The woman is asked to take a deep breath and hold it for a moment or two. The fingers in the vagina then give a sharp jerk upwards, and the fetal head is felt to rise up in the liquor amnii and leave its contact with the fingers. After a moment it is again felt settling down against the fingers, sometimes with a distinct tap suggestive of a ball stopping.

This is usually regarded as a positive sign of pregnancy, and to a careful observer is so. But mistakes have been made over similar signs given by a stalked fibroid tumor, or a stone in the bladder. Therefore, although it is all but an absolute sign, it cannot be classed along with the fetal heart-beat or active movements.

Internal ballottement can be obtained from the fourth to the seventh month. Before that the fetal head is too soft to be well felt, and later the quantity of liquor amnii is relatively too small.

BALSAMS

Balsams are resins or oleoresins which contain benzoic or cinnamic acid. And see BENZOIC ACID.

BALSAM OF PERU

Balsam of Peru is a dark brown syrupy fluid, which does not dissolve in water. It is a balsam which oozes from the trunk of the *Toluifera pereiræ*, a tree growing in Central America and India.

Balsam of Peru is used in the form of gauze saturated with the balsam. This is applied to wounds and ulcers as an antiseptic, and to promote healing by increasing the growth of granulation tissue.

When given internally, it acts as an antiseptic in the stomach and intestines, and aids in the expulsion of gas. After absorption it increases the cough and expectoration. Its effect is due to the benzoic acid which it contains. Dose, 5 to 15 minims.

BALSAM OF TOLU

Balsam of Tolu is a reddish-yellow, sticky, semi-solid substance, which dissolves in alcohol, but not in water.

BANDAGES

Its action is due to the benzoic acid which it contains. It is used principally as an expectorant. It forms an ingredient of many cough mixtures.

Preparations

Balsam of Tolu; dose 5 to 15 grains.

Syrup of Tolu; dose 30 to 60 minims.

BANDAGES

A *bandage* may be defined as a piece of flexible material suitably fashioned for application about something as a covering, a reinforcement, or a compressor.

USE OF BANDAGES

The purposes for which bandages are used may be summed up under these headings:

1. *To hold dressings, splints, and other appliances in place.*
2. *For support,* as in the case of sprained joint, etc.
3. *For pressure,* as in the case of a bleeding vessel, etc.

FORMS OF BANDAGES

Those in more common and standard use are: (a) *The Roller Bandage*, (b) *The Triangular Bandage*, (c) *The Many-Tailed Bandage*.

(a) *The Roller Bandage* is merely the bandage material which has been cut into a long, narrow strip and rolled up, from one end to the other, into a compact cylinder so that it may be more easily and quickly handled and used.

The roller bandage is by far the more commonly used one, and the one which is adaptable to the greatest variety of purposes.

(b) *The Triangular Bandage* is simply a three-cornered piece of material the shape of the half of a square which has been cut from one corner to the diagonally opposite one, or which has been folded double along this line. Aside from one or two uses which will be encountered later, this bandage will be employed only as a substitute for the roller bandage in emergency cases, as it is more easily and quickly improvised than the roller one.

(c) *The Many-Tailed Bandage* is made in a number of slightly varying designs but consists essentially either of a single oblong piece of material which has been split at each end into two or more tails, or of a combination of two or more strips whose edges have been overlapped and stitched together in the middle, leaving the ends free. The many-tailed bandage serves few purposes for which the roller

BANDAGES

bandage will not be preferred, but it has wide application and constitutes a very serviceable emergency form because it is simple to make and easy to apply.

(a) *Roller Bandages* are made of: Gauze; Muslin; Canton flannel; Woolen flannel; "Elastic" webbing (woven cotton bandage); Rubber; Crinoline impregnated with starch—the "starch bandage"; Crinoline impregnated with plaster of Paris—the "plaster of Paris bandage."

Gauze is the most frequently used material. Its advantages are that it is light in weight, cool, and so flexible that it is easily fitted to all parts. It cannot be washed or used a second time with satisfaction and is therefore a relatively expensive material.

Muslin is very suitable where greater strength is needed, as in the application of the larger splints, in the arrest of hemorrhage, and in other cases where more pressure is required than gauze will supply. It withstands washing and repeated usage.

Canton flannel, because of its combined softness to the touch and its strength, is often used where pressure is necessary over a sensitive part. It is also useful as padding underneath a plaster or starch bandage.

Woolen flannel is used chiefly for its softness of texture. It, too, is washable and can be used repeatedly.

"*Elastic*" webbing is a specially woven cotton material which furnishes the advantages of the adaptability and a large part of the lightness of the gauze, a measure of the strength of the muslin, the softness of the flannel, and the elasticity of the rubber. As a substitute for the rubber this bandage has the very desirable superiority of being highly porous, but its strength is considerably less.

The *rubber* bandage, commonly known as the "Esmarch," is made of gum rubber. It is used as a pressure or constricting bandage for the arrest of hemorrhage.

The *starch* bandage is merely crinoline which has been saturated with a boiled solution of starch, and rolled loosely after it has become dry. It is softened again in warm water for the application, and when it has dried in place it constitutes a fairly rigid and relatively light cast or splint. It will be used for the immobilization of fractured or otherwise injured parts.

Plaster of Paris bandages are made of crinoline into which has been rubbed as much plaster of Paris as it will hold. They are applied wet and in numerous layers, and when they have dried they make a very rigid, strong, and heavy encasement or splint. They are used where complete immobilization of a part is needed, particularly for fractures.

The nurse may need to make plaster of Paris bandages

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occasionally, and to do so she will proceed thus: Tear the crinoline the desired size (see below under “Sizes of Bandages”), and remove all ravelings; pour a large quantity of the plaster in a heap upon a smooth table; lay one end of the bandage upon this, brush a handful of plaster over it, rub firmly and smoothly with the hand two or three times and then roll the finished portion carefully and loosely. Proceed thus, rolling up each section of a few inches as fast as it is ready and handling very carefully so as not to undo what has been done. Substitutes for the hand, such as a wooden spatula, have been tried for rubbing in the plaster, but the hand is the best instrument in that it causes less friction and jarring and therefore produces a more smoothly and evenly impregnated bandage. Use plenty of plaster under your hand as you rub, brushing off the excess immediately before rolling the finished part. Wrap each bandage securely in paper as soon as finished.

(b) *Triangular Bandage*.—Muslin is the usual material for this bandage, but any similar material will, of course, serve as well.

(c) *Many-Tailed Bandage*.—Muslin and Canton flannel will be used for this bandage, the choice depending upon the purpose it is to serve and the part to which it is applied.

SIZES OF BANDAGES

(a) *The Roller Bandage*.—The *length* of the factory-rolled gauze bandage is usually 10 yards, and that of the muslin and flannel ones 5 yards. These have proved to be the most serviceable lengths on the whole, for these materials, the greater length being needed in the gauze because of its lighter weight and inferior strength which necessitate the use of more layers of it. The crinoline for the starch and plaster of Paris bandages may be of any length, but it is wise to vary the length with the width—that is, the narrower ones need not be as long as the wider ones.

The *width* of the roller bandage will depend upon the part to which it is applied and will vary roughly as follows:

Finger	$\frac{3}{4}$ to 1	inch
Hand and arm	$1\frac{1}{2}$ to $2\frac{1}{2}$	inches
Foot and leg	$1\frac{1}{2}$ to 3	inches
Hip	3 to 4	inches
Body (chest and abdomen)	3 to 5	inches

(b) *The Triangular Bandage*.—This bandage will vary in size with the part upon which it is used and will be in general as follows:

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Arm (the sling)	the half of 1 square yard
Hand	the quarter of the sling
Foot	the half of the sling
Head	the half of the sling
Shoulder	the half of 1 square yard
Hip	the half of 1 square yard

PRINCIPLES OF BANDAGING

Before we undertake to apply a bandage we should adopt as our fixed, guiding influences these three principles of the art.

1. *Evenness of Pressure*
2. *Durability*
3. *Neatness*

MODES OF APPLYING THE ROLLER BANDAGE

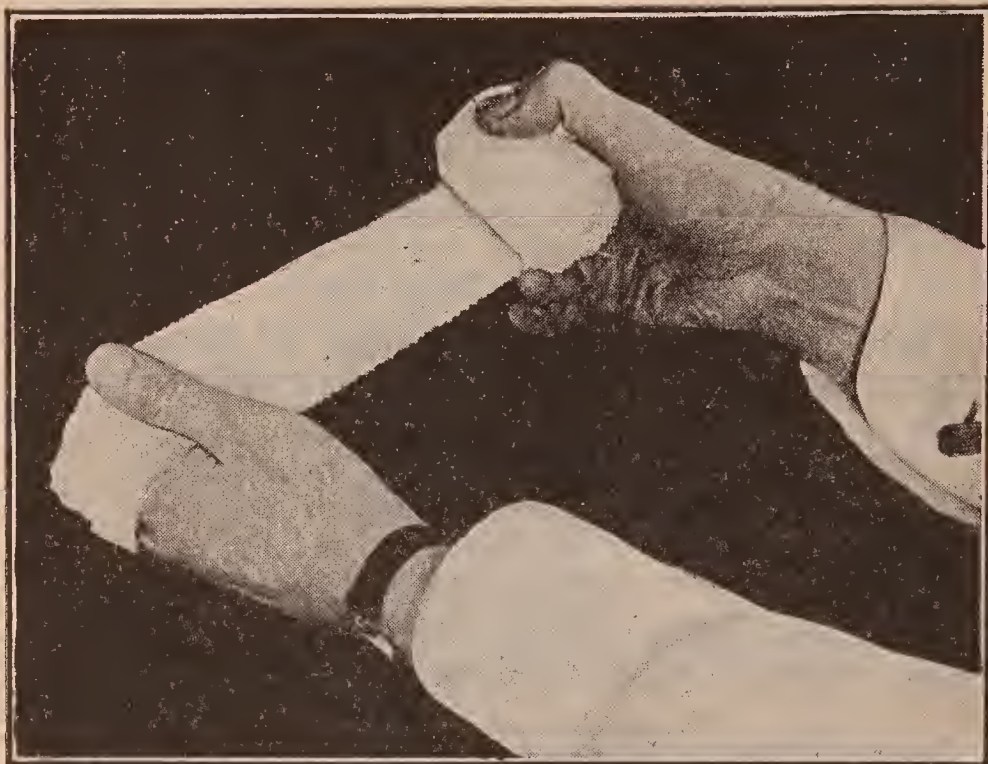
There are these five recognized modes of applying the roller bandage to the several parts of the body:

1. *Circular*
2. *Spiral*
3. *Reverse*
4. *Figure-of-8*
5. *Recurrent*

Each one of these modes has its *reason for existence* in some peculiar adaptability to a part, in a special suitability for some purpose, or in a combination of the two. Very few applied bandages, however, are pure examples of one mode, for the complexity of design in the human framework calls for a compound of two or more of them in the great majority of cases.

First of all, the part to be bandaged is arranged in the position which is to be permanent for it; the bandager takes a position in front of the patient, as a rule (exceptions will be discovered later); and the bandage is then disposed in the hands as illustrated—that is, one hand prepares to place and keep the free end where it belongs and the other to control the unwinding of the bandage as it is applied. We then study the five different modes thus:

1. Circular Mode.—*The head* is one of the subjects for this type of bandage and so, with both hands we lay the bandage against the forehead, a small portion having been unrolled for ease in properly locating it. The free end is held against the temple with the one hand while with the other the bandage is rolled around the circumference of the head with even and firm tension till it reaches the free end when it is continued over this and around the head



The way to grasp the roller bandage preparatory to applying it.
(From Colp and Keller's Textbook of Surgical Nursing)



The way to begin the application of the roller bandage.
(From Colp and Keller's Textbook of Surgical Nursing)

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again in exactly the same track. After the end has been secured the hand which held it will be released, of course, to assist the other one by carrying the roll around on its side of the head. When the roll reaches the location of the free end the second time we have a circle of two layers of bandage around the head, and have thus secured by friction and stress, or, in other words, have "*anchored*," our



The circular mode of bandaging—the usual anchorage for the applied roller bandage.

(From Colp and Keller's *Textbook of Surgical Nursing*)

bandage; and at the same time we have applied the amount of bandage which may be taken as a *standard foundation*—that is, two layers. This will rarely ever constitute a complete piece of bandaging, but it does enter into nearly every bandage as the means of both anchoring it in the beginning and of securing it at the end.

2. Spiral Mode.—For this demonstration we shall select the *upper arm*. Grasp the bandage as before, lay it upon

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the arm near the elbow, and apply a circular bandage—that is, two layers, one directly upon the other, entirely around the arm. Then begin to travel upward with slow spiral turns of the bandage, allowing each turn to cover at least one-third of the width of the previously applied one. Keep in mind, as you do this, your *three principles*, maintaining the same tension on your bandage throughout, rolling the layers on smoothly and at a stable angle (that is, not so great an angle that they will have a tendency to creep back), and make it as neat as you can by keeping the edges



The spiral mode of bandaging.

(From Colp and Keller's *Textbook of Surgical Nursing*)

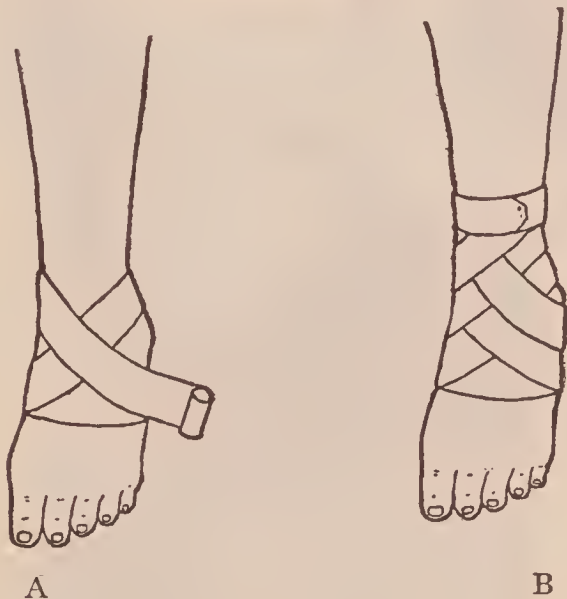
of every two layers parallel and by covering the same fraction of the width of the previous layer every time. Finished with two or more of the circular turns, this will make a complete design which is applicable only to such comparatively *parallel-sided parts* as some upper arms, the fingers, etc., or to similarly-shaped splints.

3. Reverse Mode.—The *forearm* is a suitable part upon which to demonstrate this mode because of its cone-like outline. It will be a good plan for the beginner to apply, first of all, a few turns of the spiral bandage to this part in order to learn at once why it will not answer. She will see that it embodies an infraction of every one of the three

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principles of bandaging—that is, the two edges of the bandage exert unequal degrees of pressure, which is very clear from the fact that one of them is entirely free of tension in a part of every turn; it will not stay in place, as its appearance very clearly indicates and as a slight pull would demonstrate; and it certainly does not look neat. We can correct all these evils very easily, however, in this way:

Start just above the wrist with the now familiar circular bandage; then begin one of the spiral turns, but just as the lower edge of the bandage shows the objectionable *slack*, which is due to its having a shorter distance to cover than the other, *turn the roller upside down*, thus making a twist in the bandage which uses up this slack and allows the bandage to lie flat for the remainder of the turn, when the same problem will arise and it will be solved in the same way for each turn until the part is covered. In the



A

B

The figure-of-8 mode of bandaging. A, the first turns; B, the completed bandage of the ankle.

(From Colp and Keller's Textbook of Surgical Nursing)

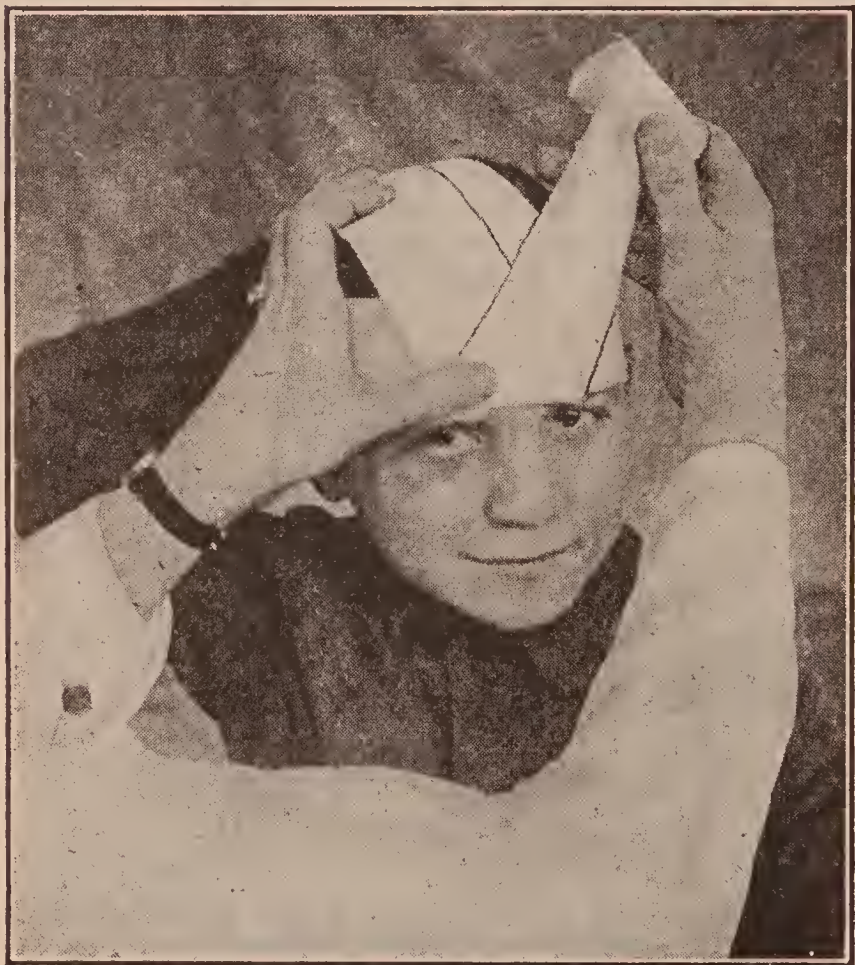
act of twisting, or "reversing," the bandage, special care is required to avoid stretching it so tightly that it will be drawn into wrinkles instead of into one flat fold. This is done by holding the applied bandage down with one hand just at the site of the reverse while the free part is allowed to slacken slightly for the moment of the reversal, after which the usual tension is resumed for the next turn. This bandage will be secured at the end with the usual circular bandage.

A great deal of practice will be required before one can apply the bandage well by this mode, and if it cannot be done well some other mode should be used instead, for there

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are too many loopholes in it for offenses against all of the three principles of bandaging. It is a very suitable method, however, for tapering parts, such as the arm and leg, and if one wishes to become a versatile bandager she must learn it.

4. Figure-of-8 Mode.—*The ankle* furnishes us with a good subject for this mode of bandaging. Start, as usual, with



The recurrent mode of bandaging. The patient is holding the reverses in place at the back of the head. On a smaller part, such as the stump of a limb, the bandager can control the entire operation himself.

(From Colp and Keller's Textbook of Surgical Nursing)

the circular bandage as your anchorage, placing it around the foot just at the base of the arch; then pass the bandage in figure-of-8 style thus: Diagonally across the instep toward the base of the heel, around the back of the heel, and across the instep again in the other diagonal to the original circular bandage on the side opposite the starting point of the first diagonal (A of Fig.). This completes one figure-

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of-8 turn, and the bandage is continued simply by repeating this maneuver till the part is covered, lapping each turn over one-third or one-half of the width of the preceding one. If this is to constitute a complete dressing it will be secured by the circular bandage around the ankle (B of Fig.).

Though the design of this bandage is not the simplest one to learn, aside from that it is one of the easiest modes with which to secure good results under all of the three principles. Durability is an especially prominent feature of the figure-of-8 bandage, and its appearance can be made to compete very favorably with that of any of the other modes.

The figure-of-8 design has a very wide application, being almost the only suitable one for the *joints of the body*,



Completed recurrent bandage. Note that the turns all lie flat, and that they converge toward the middle of the forehead, which means that the reverses are lying directly over one another, as they should do.

(From Colp and Keller's Textbook of Surgical Nursing)

particularly the larger ones, such as the ankle, knee, hip, wrist, elbow, and shoulder; and it is also applicable, *in combination with the reverse mode*, in various other parts which will be indicated later.

5. Recurrent Mode.—This is perhaps the most difficult

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mode to learn and it is also rather awkward to apply, in that it requires the assistance of a third hand when applied to the head, which is the most common subject for it. Often the patient himself will be able to lend this helping hand, but if he cannot do this an assistant must be provided. As it will probably be the only available part for practice, we shall select the head for our subject. Pass a circular bandage around the head, as described in Mode 1, stopping at the middle of the forehead; then reverse the bandage by the same maneuver as you used for the reverse mode, and pass the roller backward across the middle of the head and down over the circular turn at the back, holding the fold of the reverse firmly in place with the thumb of the other hand meanwhile, and now asking the patient or the assistant to place his hand upon the intersection of the layers on the other side. Repeat this process, back and forth, till the whole head is covered, working from the middle toward the sides alternately, and covering one-half of the previous layer each time. In stationing the reverses it will be found possible and easiest to group them closely together (each immediately on top of the previous one) in the middle of either side rather than to distribute them along the circular bandage, as they can be more easily held in place this way and they will usually fit the part better thus. When the head has been entirely covered the bandage is again reversed to the direction of the original circular bandage and two more circular turns are passed around the head to secure the ends which you and your assistant have been holding.

This makes a complete bandage which will often be used for the stump of a limb, the end of a finger, etc., as well as for the head.

THE APPLICATION OF BANDAGES TO VARIOUS PARTS

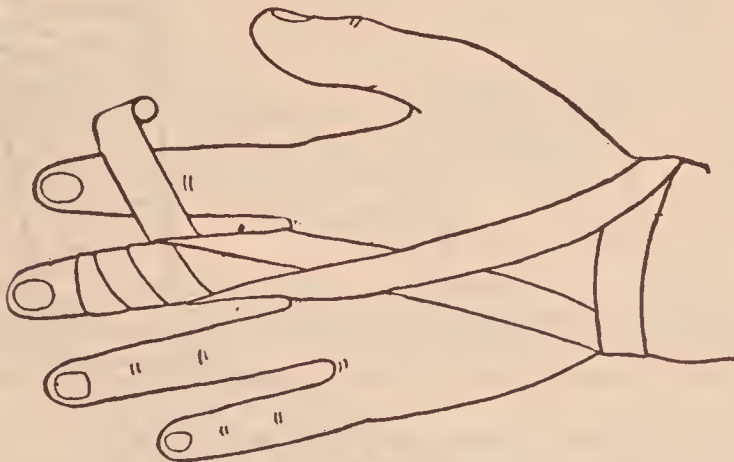
(a) *The Roller Bandage*

Hand and Arm

Either the spiral or the combination of the figure-of-8 and reverse modes will be found suitable for the *fingers*, with the introduction of the recurrent mode if the ends of the fingers are to be covered. As a rule, however, a finger bandage will not be durable unless it is connected with the wrist by means of a figure-of-8 and a circular bandage, introduced after every second or third spiral turn. Each finger may, of course, be bandaged in this way separately, but in everyday practice it will be found that when two or more fingers need bandaging they will usually be combined in one dressing

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and bandaged together, in which case the method for a single finger will apply. In cases where all the fingers are involved they will usually be combined in a single large dressing and the suitable mode of bandaging them will then be the recurrent one. The finger bandage may be anchored either around the wrist or the end of the finger.



Spiral bandage of the finger anchored to the wrist with a figure-of-8 and a circular turn.

(From Colp and Keller's Textbook of Surgical Nursing)

The *thumb* presents a somewhat different case from the fingers in that it is nearly always bandaged with what is termed the "*spica*" bandage. This *spica* involves nothing new as to mode, for it is a pure figure-of-8, but it so



The thumb *spica*.

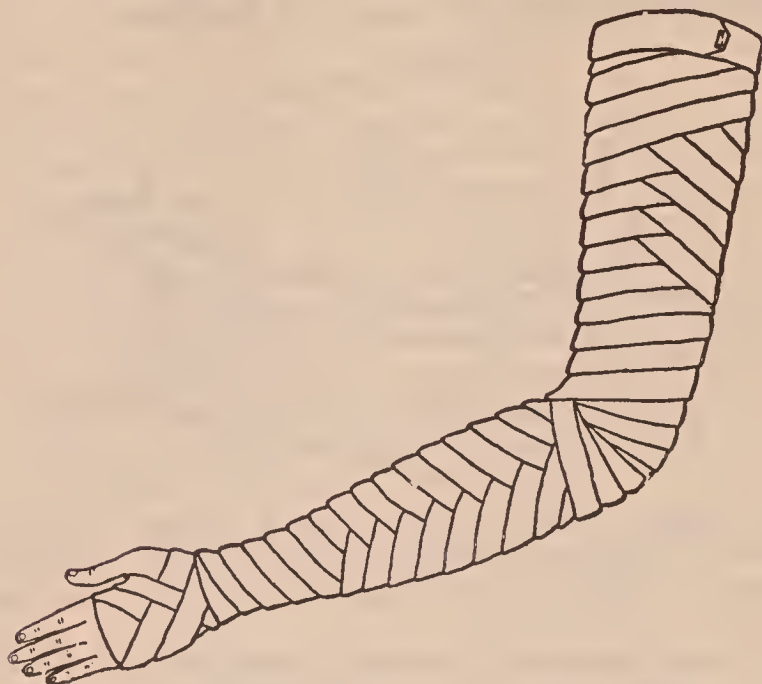
(From Colp and Keller's Textbook of Surgical Nursing)

happens that in the complete design the layers present the appearance of the spikes in a head of barley, and therefore the bandage has been given the distinctive name "*spica*." Though the term has its origin in the mere appearance of the completed bandage, "*spica*" always carries with it the

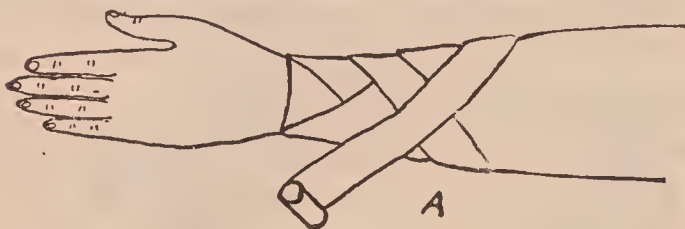
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meaning of a joint bandage because the figure-of-8 takes on this appearance in all cases of its application to a joint which connects an appendage to its trunk.

Whether or not the fingers and the thumb are involved, our method of procedure for the *hand and arm* will be this:



Complete bandage for the hand and arm.



Reverse figure-of-8 bandage. A, front view showing the figure-of-8 turn; B, rear view showing the reverse turn.

(From Colp and Keller's *Textbook of Surgical Nursing*)

Begin about the palm with the circular bandage, then a spiral or two if necessary, and proceed with the figure-of-8 over the back of the hand and the wrist, around the wrist with the circular, upward over the cylindrical part of the forearm with the spiral, and thence with the reverse over the conical

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part to the elbow. The elbow (in a slightly flexed position) is then covered, directly over the joint, with two or three circular turns, several figure-of-8 turns (enough to cover it securely) are passed over this and about the joint, working upward and downward from the joint alternately. The



Method for securing better anchorage of a bandage on a tapering part. The long spiral turns provide friction for the remainder of the bandage and also stabilize the wrist portion.

(From Colp and Keller's Textbook of Surgical Nursing)

upper arm is then covered with either the spiral or the reverse, depending upon whether it is of a general cylindrical shape or a conical one.

On the *shafts of the arm* a combination of the figure-of-8 and the reverse modes is very suitable, the figure-of-8 being used as the theme and the reverse being introduced only



Heel bandage. A, regular circular and figure-of-8 method; B, variation necessary for a prominent heel—an interlocked figure-of-8.

(From Colp and Keller's Textbook of Surgical Nursing)

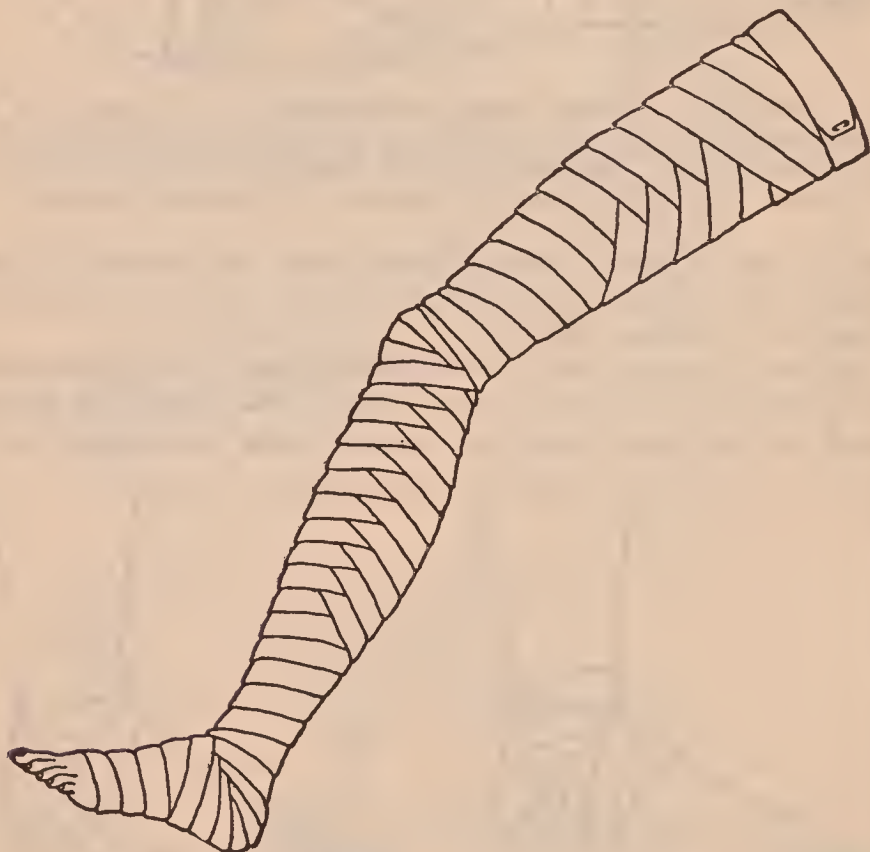
when needed to keep the bandage lying flat and to equalize the tension of the edges, which will usually be every second turn. In this case the cross of the figure-of-8 turn is made on the top of the arm and the reverse on the back. This bandage is very much preferred to any other by some persons because of its *superior durability*.

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Foot and Leg

The *toes* may be bandaged separately, like the fingers; and when the figure-of-8 extension is necessary to keep it in place the ball of the foot will usually answer as the wrist does for the fingers. Also, as in the case of the fingers, when several or all of the toes are involved they will usually be dressed together and the bandage will be the recurrent one.

When *the heel* is involved the principles of the elbow bandage may be applied to it—that is, after the circular turns have been applied around the arch of the foot a long



Complete bandage for the foot and leg.

(From Colp and Keller's Textbook of Surgical Nursing)

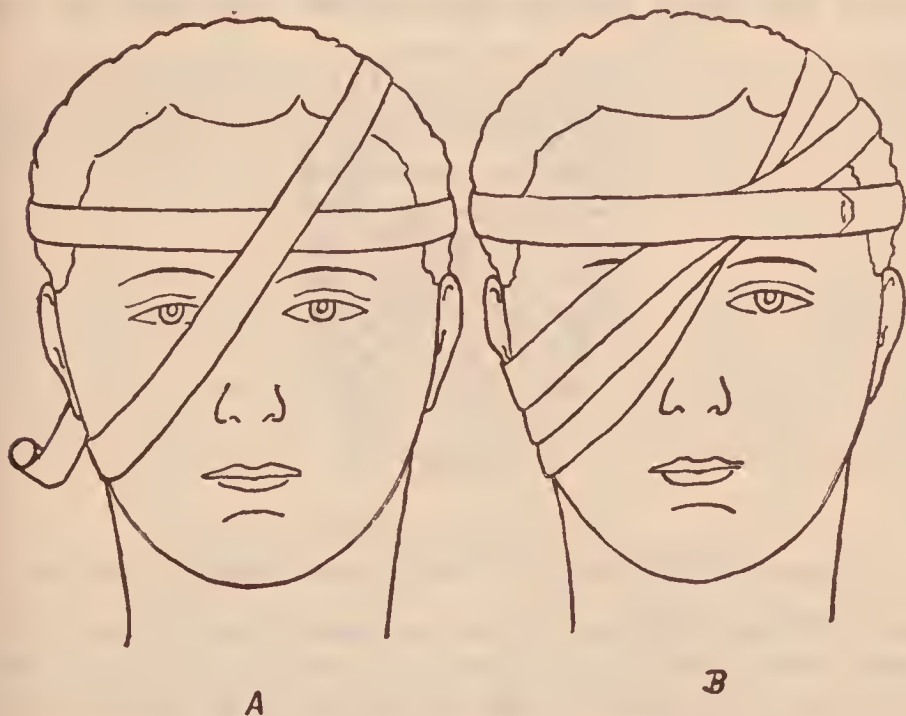
spiral turn of the bandage will carry it smoothly to the heel, a circular bandage is applied around the heel and the instep, and the figure-of-8 ankle bandage is then applied as in the case of the elbow.

In cases where the heel is unusually prominent it will be impossible to cover it smoothly with the figure-of-8 bandage. This difficulty may be overcome by modifying the design for several turns as illustrated in B of Fig. An analysis of these turns will show that they constitute merely an interlocked figure-of-8 passing crosswise of the ankle.

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In general principles the *foot and leg bandage*, as a whole, is exactly like that for the hand and arm. Disregarding the toes, we start around the arch of the foot with the circular turns, and one or two spirals if needed. Then cover the heel as described in the preceding paragraphs. This will entail the figure-of-8 of the ankle. The details for the remainder of the leg will then correspond exactly with those given for the arm, including the several variations pointed out there.

The *knee-joint bandage*, of course, will be upside down from the standpoint of the bandager as compared with the elbow, but this will not cause any noteworthy confusion.



A

B

The eye bandage. A, the first two circular turns in place; B, the completed bandage for one eye.

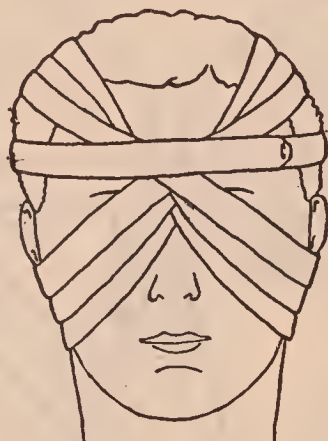
(From Colp and Keller's Textbook of Surgical Nursing)

The Eye

The eye bandage becomes a very simple one if we conceive of it as being constructed, as it really is, entirely from the elementary circular bandage. Accordingly, let us imagine our standard circular bandage to be rigid, like a barrel hoop, and fit it thus into the several positions of the layers in the eye bandage. First of all, we place it around the top of the head as we did the circular bandage; this is our foundation, or anchorage. Then we imagine this circle on a pivot near the base of the nose and swing it down over the eye we are to bandage till it reaches the neck just below the ear on that side, and meanwhile, on the opposite side just

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over the other ear it will have risen somewhat above our foundation circle. The two circles will now cross each other on the forehead and on the back of the head. Then we swing our circle again but only far enough this time to cover one-half or one-third of the width of the parts of the other layers which lie below the one ear and above the other. In other words, this layer lies the width of the lap nearer each ear than the preceding one and crosses it on the forehead and on the back of the head at the sites of its intersections with the horizontal turn. This maneuver is repeated until we have enough angling layers (usually two or three) to cover the eye well, and then we swing our circle back again into the first position and apply one or



Double eye bandage.

(From Colp and Keller's Textbook of Surgical Nursing)

two of the horizontal turns to anchor the whole. On some heads it may be necessary to anchor each angling circle with the horizontal one, but this will mean merely swinging the circle alternately from one position to the other.

The flexible bandage will not perform with all the mechanical exactitude of the rigid hoop, of course, and the changes in plane will have to be made with gradual sweeps, but these will be easily managed if the student has her picture of the hoop structure clearly in mind.

To bandage both eyes all one needs to do is to alternate the angling turns between the two eyes, and as a rule one anchoring turn should be applied for each pair of angling ones. The whole is, of course, anchored finally with one or two of the horizontal turns.

The Ear

The ear bandage, for either one or both ears, will correspond to that for the eyes in all detail except that more turns will be necessary as a rule. In bandaging one ear

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it is sometimes difficult to avoid covering the opposite one also, but by careful planning this difficulty can practically always be overcome.

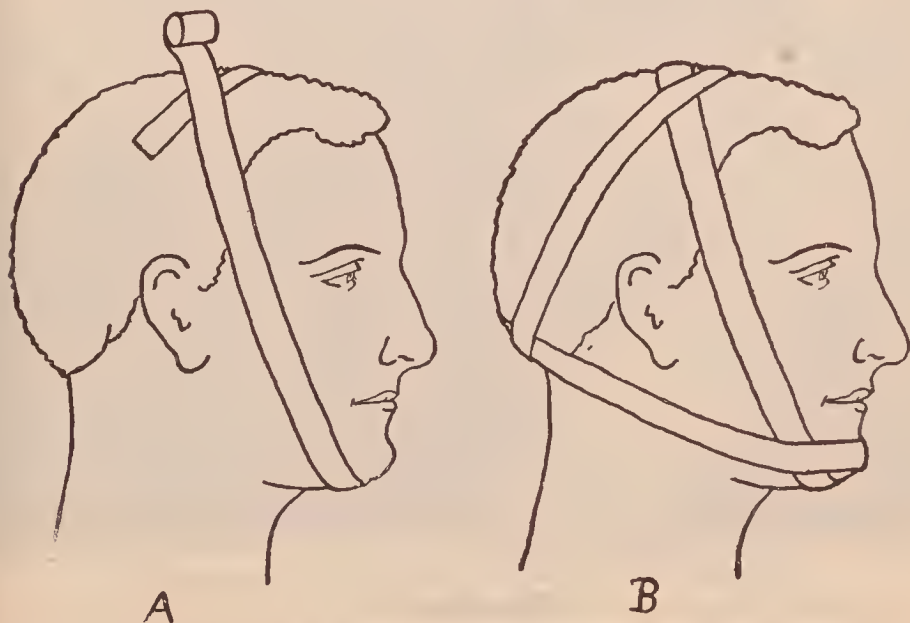


The ear bandage. Note that it is merely the eye bandage design slipped about one-quarter of the way around the head, and that more turns are required for the ear region than were needed for the eye.

(From Colp and Keller's Textbook of Surgical Nursing)

The Face and Jaw

The Barton bandage of the jaw will be used in case of fracture where immobilization is desired. When analyzed this may be called a compound figure-of-8 bandage, for it is composed of two figure-of-8's which have one loop in common—that is, the loop which envelops the crown of the head makes a figure-of-8 with either one of the two adjoining



The Barton bandage. A, method of anchoring; B, the complete design. As this is usually a pressure bandage two or more layers will usually be necessary. The fastening of this bandage is not shown as it will be best placed on the head or face turn on the other side.

(From Colp and Keller's Textbook of Surgical Nursing)

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ones. To apply this bandage, begin by laying the end of the bandage diagonally across the top of the head, pass downward across one cheek, underneath the chin, upward over the



Two methods of bandaging the cheek, temple, or chin. A, a simple figure-of-8 which will fit a head with a prominent crown; B, method necessary when the crown of the head is flatter, the turns about the forehead alternating with the others and binding them in place. Bandage A is fastened on the other side of the head.

(From Colp and Keller's Textbook of Surgical Nursing)

other cheek, across the head in the other diagonal (A of Fig.), downward and around the back of the head, forward around the front of the chin, thence to the back of the head, and then upward to the starting point at the top of the head. This is the complete design of the bandage (B of Fig.), but as it is usually applied for pressure upon the jaw one or two layers more will be added. This bandage will usually be applied under considerable tension.

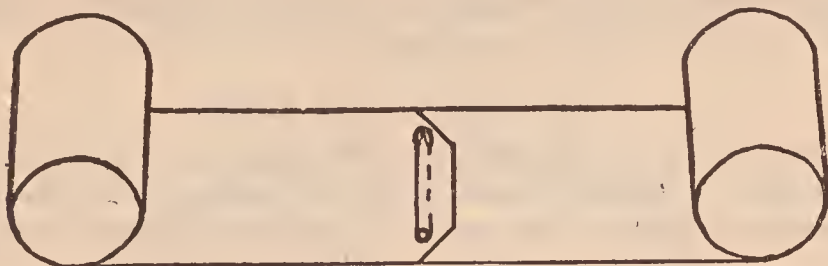
The illustrations show *two ways of applying a bandage to the cheek, temple, or chin*. They need no special explanation except that they are started like the Barton bandage. Since heads vary so much in shape a trial must always be made of the first turn of these bandages to make sure that it is stably stationed. A variation forward or backward, on the top of the head, of the starting point, will always enable one to find the proper balance.

The Head

The appropriate bandage for the head is the recurrent one. A more convenient way to apply the head bandage, however, is with *two roller bandages*, the ends of which have been carefully pinned or sewed together. For this we proceed thus: Lay the bandages against the middle of the forehead,

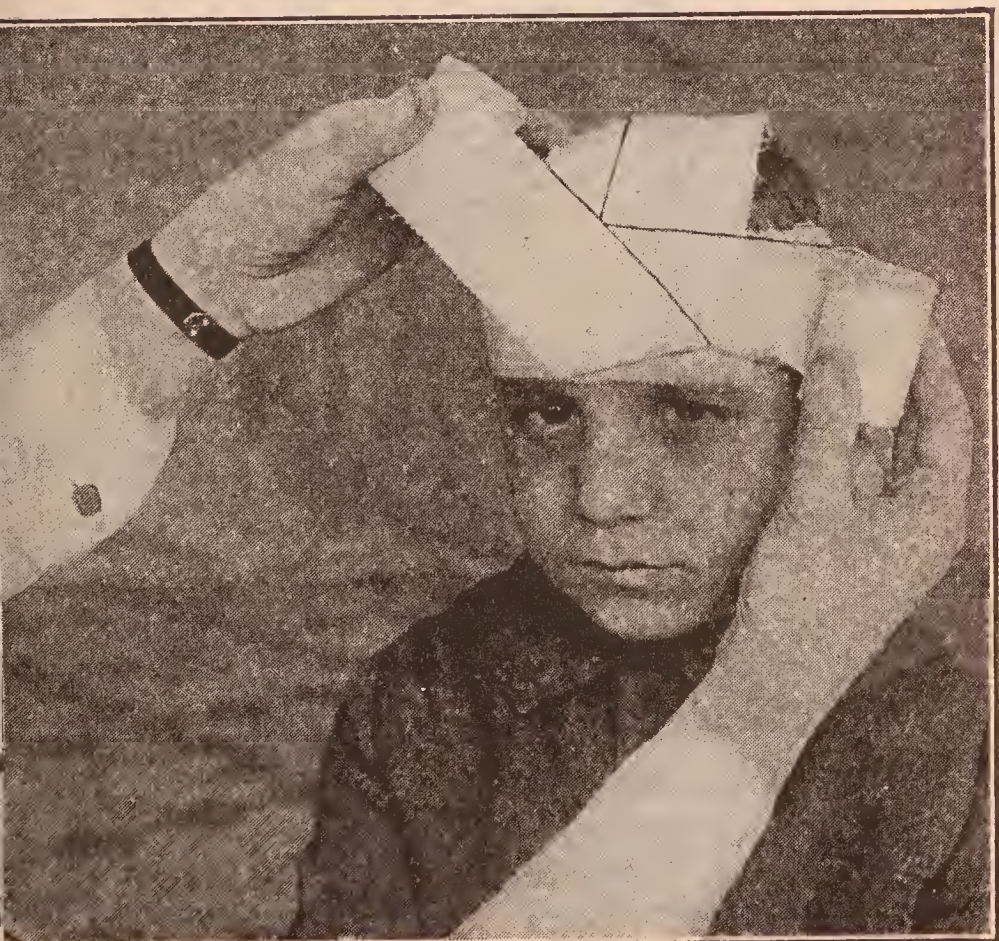
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and then hold one stationary while you apply the anchoring circular bandage about the head with the other. Then pass the bandage which has been idle across the top of the head



Double roller bandage for the application of the recurrent bandage.

(From Colp and Keller's Textbook of Surgical Nursing)



The way to use the double roller bandage.

(From Colp and Keller's Textbook of Surgical Nursing)

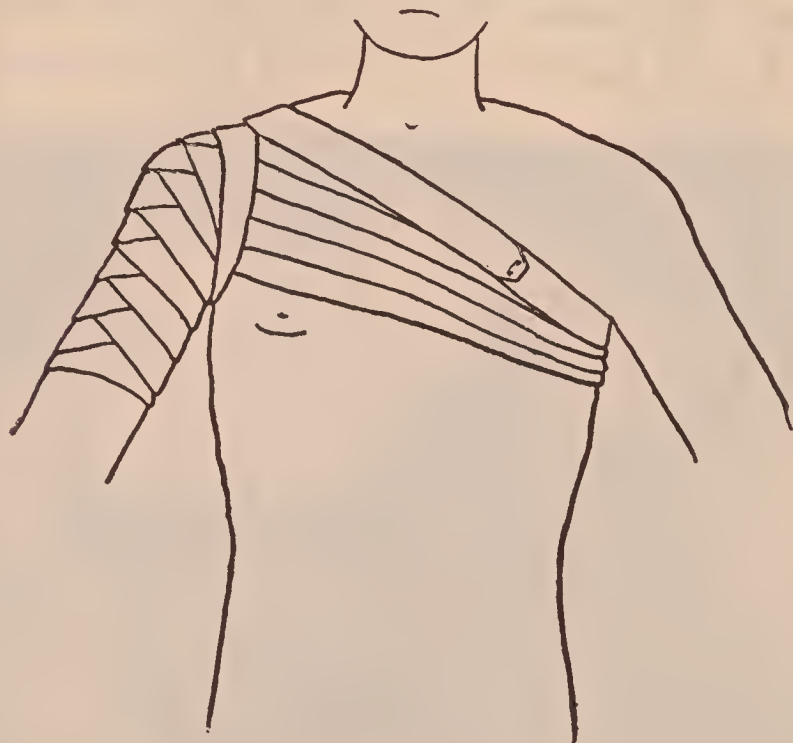
to the circular turn at the back, roll the other bandage across this (Fig.), and then continue carrying the one bandage back and forth over the top of the head and binding it down at each end by the circular turns of the other.

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The whole head may, of course, need to be covered thus, but the student should form the habit (which does not seem natural for beginners) of putting on only as much of the head bandage as is necessary to keep the dressing in place, as it is very easily discontinued at any point.

The Shoulder and Axilla

The "*spica*" is the bandage most frequently used for the shoulder. Like the thumb spica, of course, it is merely a figure-of-8 design, and needs no comment except, perhaps,



The spica bandage of the shoulder.

(From Colp and Keller's Textbook of Surgical Nursing)

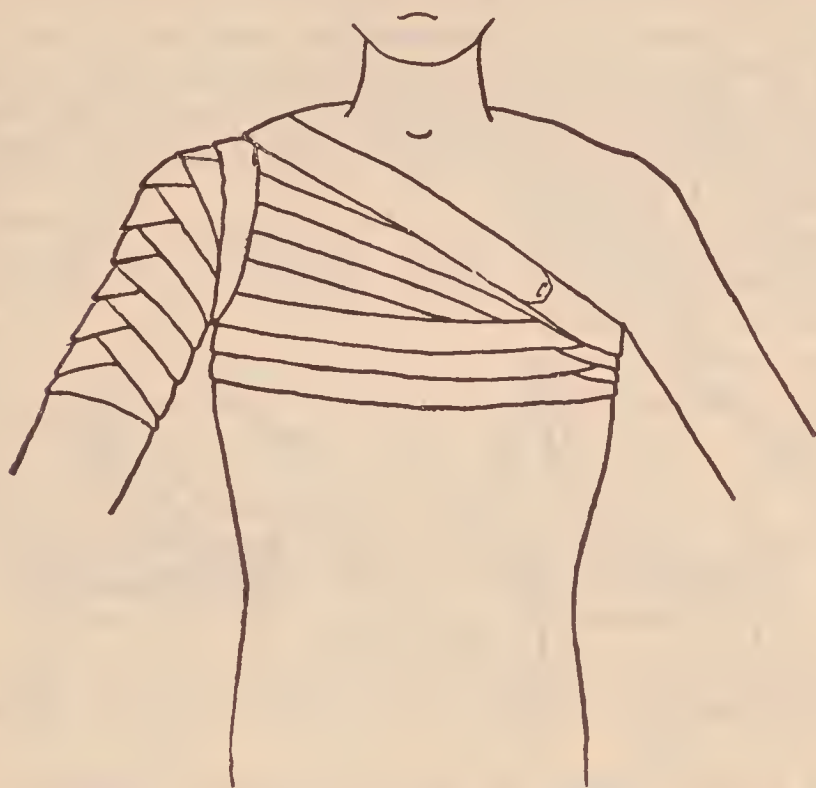
to point out that the application of it is begun about the arm, and that a few spiral or reverse turns should be made around the arm for secure anchorage before beginning the spica proper.

When there is a dressing in the axilla to be covered the shoulder spica may be varied by alternating turns around the chest with the figure-of-8 turns.

The Velpeau bandage will be used to immobilize the shoulder in such cases as fracture of the clavicle or scapula or dislocation of the shoulder. Place the arm of the injured side across the chest so that the hand lies well up toward the other shoulder. Start the bandage by placing the end

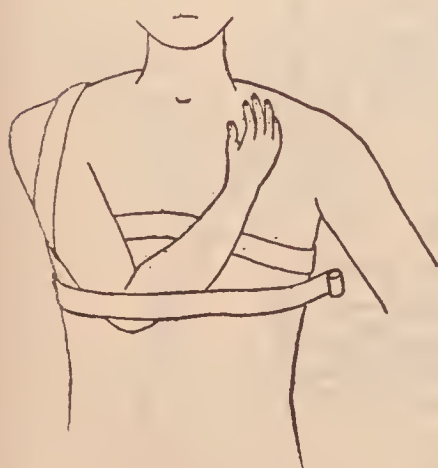
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over the scapula of the sound side, carry the roller forward over the injured shoulder, angling downward and underneath the humerus, and thence forward over the anterior chest and around to the starting point (A of Fig.).

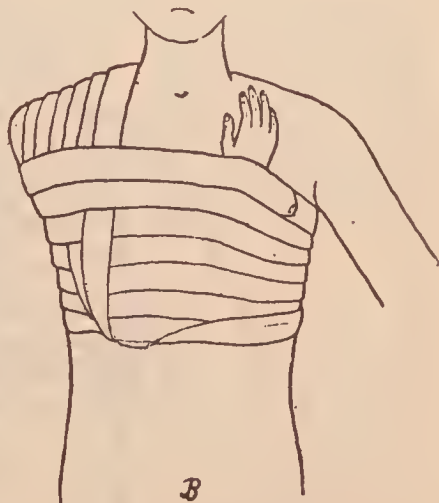


The shoulder spica bandage varied to cover the axillary region.

(From Colp and Keller's Textbook of Surgical Nursing)



A



B

The Velpeau bandage. A, the first turns, two or more layers being necessary, as a rule, in the turn about the humerus; B, the completed Velpeau.

(From Colp and Keller's Textbook of Surgical Nursing)

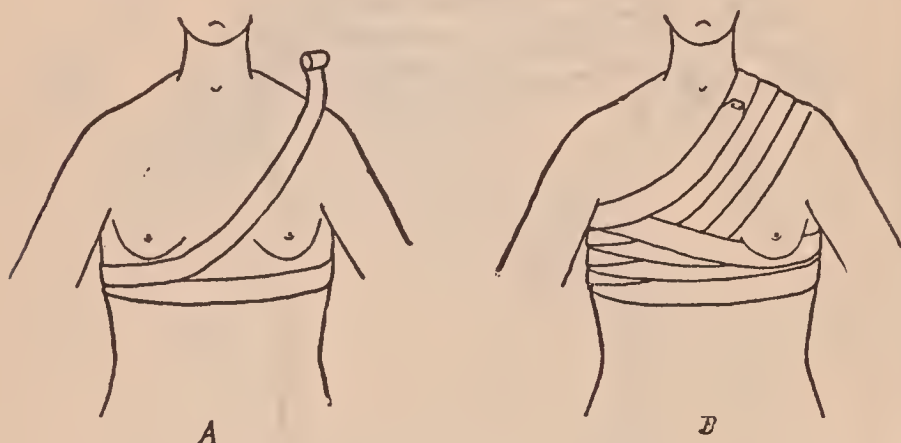
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Repeat this turn once for security and strength, then make a circular turn around the chest and over the arm just at the elbow, and then complete the bandage by alternating these two turns till the whole arm has been covered (B of Fig.).

The Breast

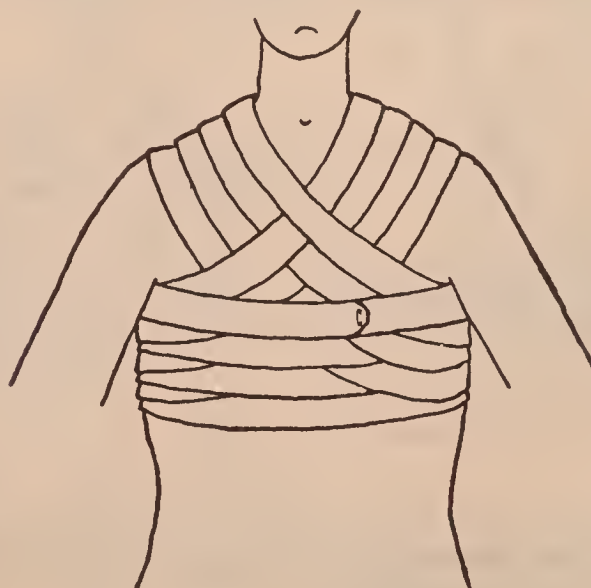
This bandage is another figure-of-8, one loop of the figure passing horizontally about the chest and the other diagonally between the affected side and the opposite shoulder (A of Fig.).

Start underneath the arm of the affected side and anchor the bandage with two circular turns about the chest just



The breast bandage. A, the way to start the bandage; B, the complete design.

(From Colp and Keller's Textbook of Surgical Nursing)



The double breast bandage.

(From Colp and Keller's Textbook of Surgical Nursing)

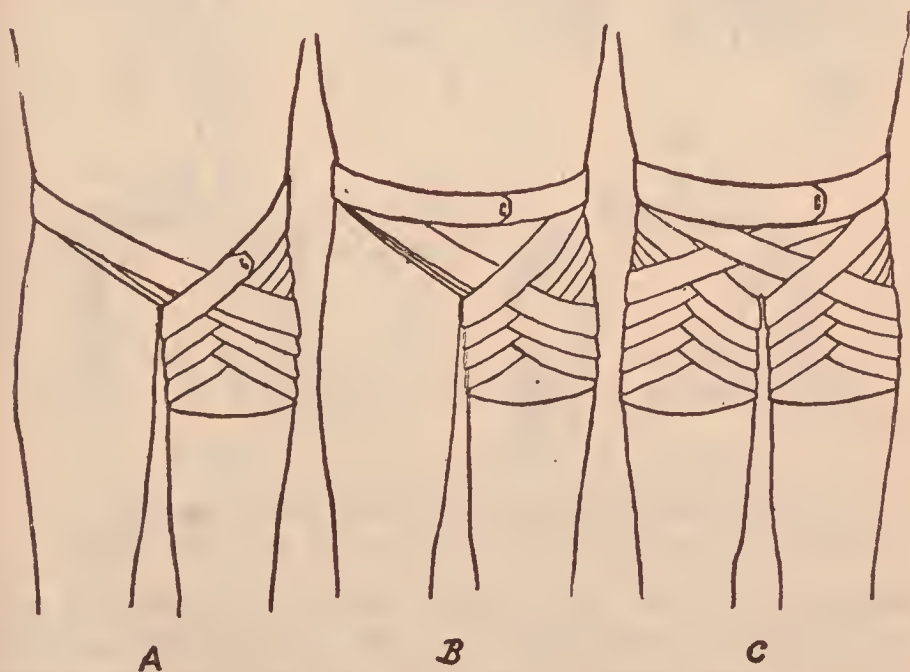
BANDAGES

beneath the breast, passing the roller across the anterior chest first and then around the back—that is, when the right breast is to be bandaged the end of the bandage is placed under the right arm and the roller is carried across the anterior chest to the left arm; and for the left breast the direction is reversed. The anchorage completed, the first diagonal turn is started directly underneath the breast, and is carried well over on the opposite shoulder, thence angling downward across the back and around to the starting point. These alternate horizontal and diagonal turns are then repeated till the whole breast is covered (B of Fig.).

To bandage *both breasts* at the same time, start as for one. Apply the first diagonal turn, start the next horizontal turn but carry it only as far as the opposite side and then instead of completing it carry it diagonally upward across the back to the other shoulder, and thence diagonally downward across the anterior chest and underneath the other breast. Then apply a complete circular turn and extend it around to the starting point under the first breast. Continue the bandage by alternating the diagonal maneuvers with the horizontal one till the breasts are covered.

Hip Spica

There is no essential difference between this bandage and the spica of the thumb. The hip spica is sometimes applied



The hip spica bandage. A, without the circular turn about the waist; B, with the circular turn alternating with each figure-of-8; C, the double spica applied with a single bandage.

(From Colp and Keller's Textbook of Surgical Nursing)

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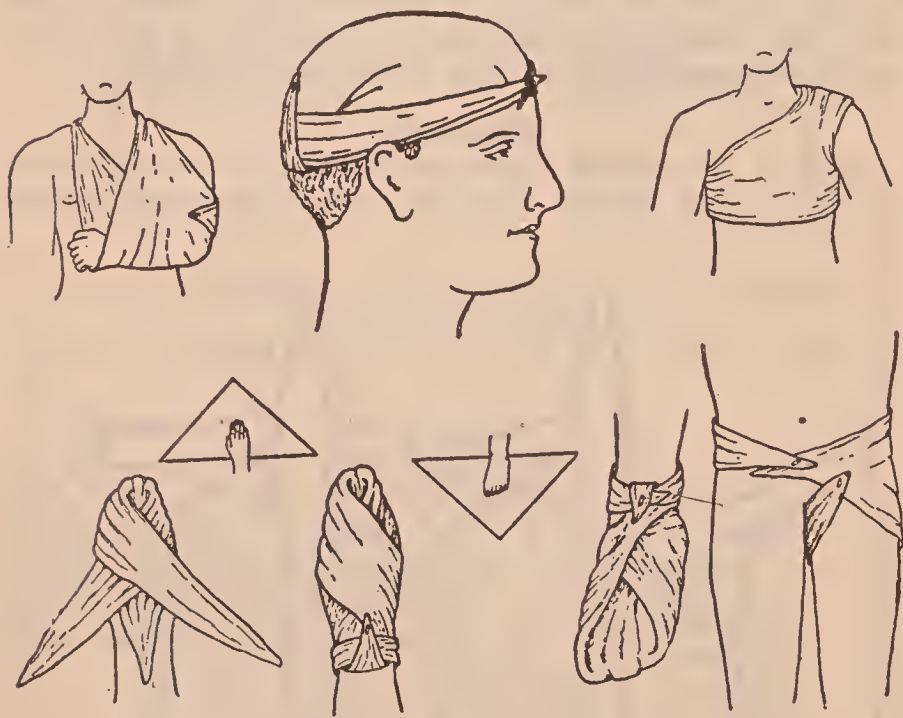
without the circular turns about the waist (A of Fig.), but the alternation of the circular turn with each figure-of-8 (B of Fig.) makes a more durable bandage and one which will be more comfortable for most patients. Any part of the hip region may be covered with this bandage by simply placing the spica directly over the wound. This bandage may be started around either the waist or the leg.

A double hip spica is very readily applied with one bandage by simply alternating the figure-of-8's between the sides and inserting circular turns about the waist between them each time (C of Fig.). This bandage may be started around either the waist or one leg.

For the application of these bandages it will be necessary to elevate the patient's hips on a rest.

(b) *The Triangular Bandage*

As remarked previously, the triangular form of bandage, with one or two exceptions (chiefly the sling), is an



Various applications of the triangular bandage.

(From Colp and Keller's *Textbook of Surgical Nursing*)

emergency one and will be used only in the absence of the roller bandage. Emergencies, however, are very important and the nurse should, therefore, not consider her bandaging education complete till she has become adept with the triangular bandage. Parts to which this bandage may be applied are the arm (sling), hand, head, foot, shoulder, hip,

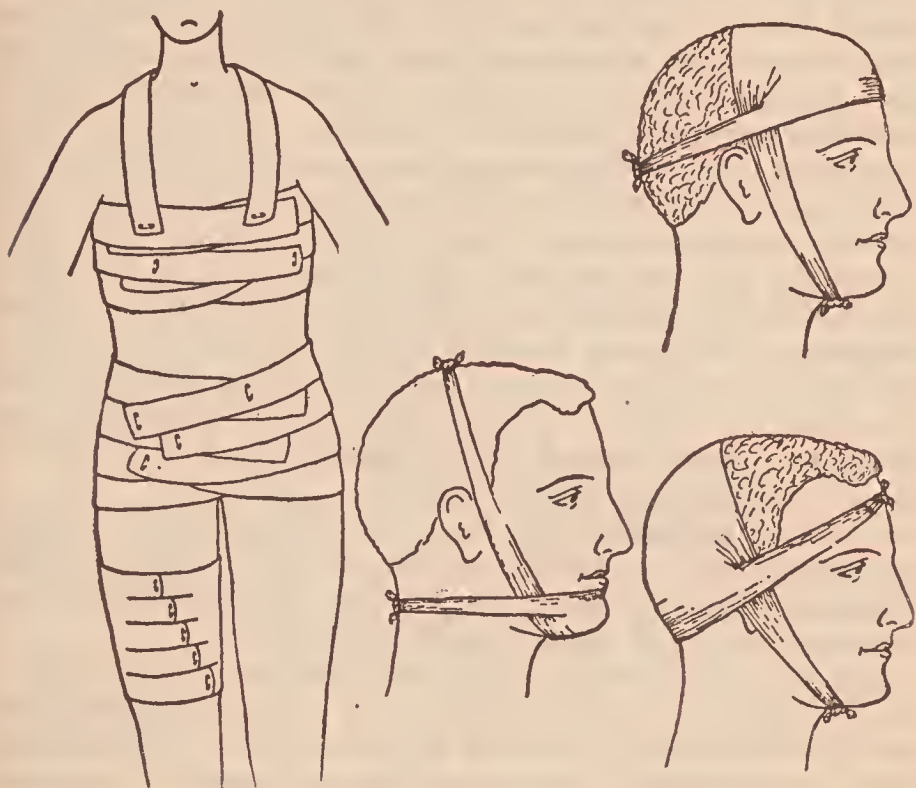
BANDAGES

etc., and the illustrations will give all the suggestions she will need for the several cases.

The three principles of bandaging are, of course, as applicable to this form of bandage as to the roller one.

(c) *The Many-Tailed Bandages*

The student's first concern as to these bandages is to make them of the proper size, because they must fit well if they are to be faithful to our three bandaging principles. Parts



Various applications of the many-tailed bandages.

(From Colp and Keller's *Textbook of Surgical Nursing*)

to which the several types are applicable are the head, chin, breast, abdomen, arm, leg, etc., and the illustrations will show the variations suitable to these different parts.

MISCELLANEOUS SPECIAL BANDAGES

The *plaster of Paris bandage* is a roller bandage, but as it is applied wet and eventually becomes very rigid its application involves a few points which differentiate it from the average roller bandage. First of all, the plaster is never placed directly upon the skin, a substantial padding of cotton, Canton flannel, or stockinet, etc., always being used underneath it. The nurse will rarely ever apply this bandage herself but she will assist with it and her part will doubtless be the soaking of it. This she will do by

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standing it on end in a basin of sufficient warm water or weak salt solution to cover it. A very few moments will suffice for saturating it, the cessation of the bubbling which always follows immersion indicating that it is ready for use. Since you have probably made the bandage yourself you will know how insecure the plaster is within it and will therefore be very cautious about the removal of it from the water. It must be squeezed just enough so that the water will no longer drip from it—no more and no less—for if too wet the dripping water will carry the plaster away with it and will unnecessarily wet the padding, and if too dry it will become hard before it can be applied. Your method, therefore, will be to encircle the bandage very cautiously with a hand at either end, compress the ends gently at the same time, lift it out of the water, and simultaneously extend your pressure over the remaining surface just sufficiently to stop the dripping—but do not twist it. Practice is required to do this well and without wastage of the bandages, for it must be done quickly as well as carefully. As light wood splints are sometimes used to reinforce this bandage they will be part of the nurse's preparation, as will also a small amount of dry plaster which is sometimes used for finishing the surface of it.

For the application of *the starch bandage* the nurse's preparation will be similar to that for the plaster, but the bandages will not require the extreme care in handling and they may be more nearly freed of the water.

The *Esmarch bandage* is sometimes applied for the purpose of reducing the venous circulation of a congested part and thereby increasing its arterial supply and the accompanying local nourishment. This constitutes a special treatment known as the "Bier's" treatment. It will, therefore, never be administered except by special order, but it belongs to the subject of bandaging and there are several points about it which the nurse should learn.

The treatment is usually administered to some inflamed part of the extremities, and the general rule of applying the bandage from below upward will hold in this case. The mode of application will be the spiral one; the bandage will be applied above the inflamed part; and as the object of the bandage will be to restrict the venous circulation and not the arterial, it must not be applied too tightly. The frequency and duration of this treatment will be prescribed, and while it is in operation the nursing attention must be faithful. The parts below the bandage should retain their normal temperature; there should be no accompanying pain; the pulse in the part should not be altered; but a moderate amount of swelling and edema, and a bluish-red

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color, should be expected. As a rule, the part will be elevated after the bandage has been removed to hasten the reduction of the edema, but the nurse will be guided by instructions from the surgeon as to this.

Varicose veins of the leg are sometimes treated with a *pressure bandage*. The material to be used for this bandage will usually be prescribed, and it may be any one of those we have already discussed. The elastic materials, however, will probably be given preference, though where elasticity is desired it may be secured in some degree with an inelastic bandage by first covering the part with a thin layer of non-absorbent cotton. The importance of this bandage from our present standpoint lies in the requirements that it be very smoothly and evenly applied, that its tension be sufficient to support the enlarged veins without obliterating them, and that it be applied as follows: Elevate the foot somewhat before applying the bandage so that the veins will not be unnecessarily engorged; start the bandage near the toes; and use the spiral form as much as possible throughout, departing from it only sufficiently to secure even pressure over the more irregularly shaped parts.

A *pressure bandage* is sometimes applied to the extremities, particularly the legs, in case of shock to reduce the circulation in them to some degree and thereby to conserve the heart's energy somewhat. A generous layer of non-absorbent cotton should always be used under this bandage because, while it furnishes the usually desired elasticity it also conserves the body heat which is vitally important in such cases.

THE FASTENING OF THE BANDAGE

(a) *The Roller Bandage*

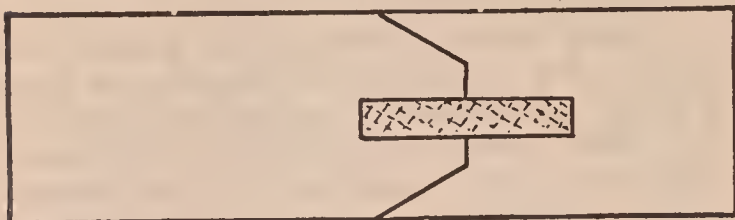
First of all, *the site selected* for the securing of the end of the bandage should be remote enough from the wound to avoid causing pain to the patient by the manipulation necessary. If not inconsistent with this point, an accessible place should be chosen for evident reasons. And of not the least importance is the point that all fastenings that protrude, such as knots and safety pins, should be so placed that the patient will not have the discomfort of resting upon them.

There are *four good methods* for fastening the bandage and they have their special adaptations and limitations as follows:

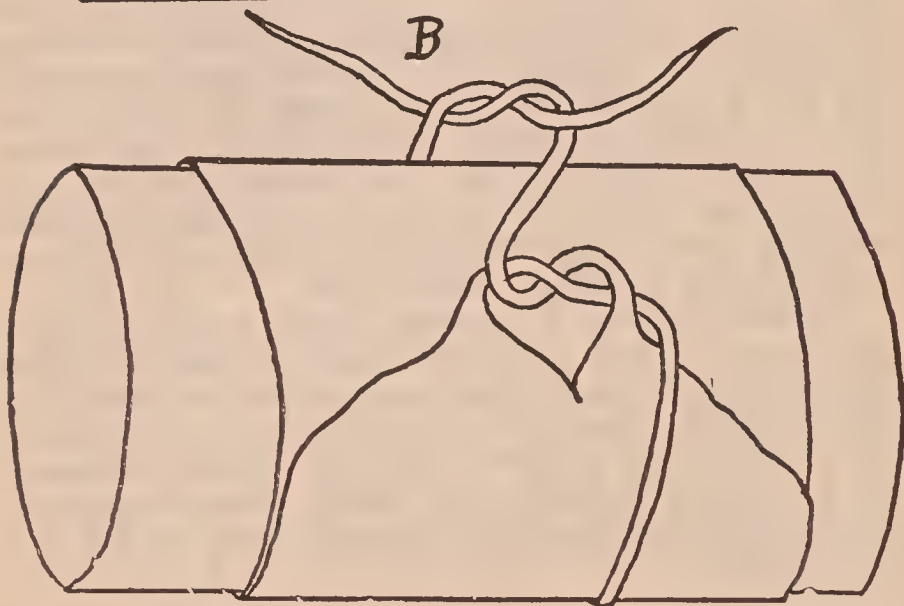
1. Safety Pin.—This will apply to most bandages and it is a very satisfactory one because it can be passed through all the underlying layers and so bind them all securely together. It may sometimes be objectionable, however, for children in



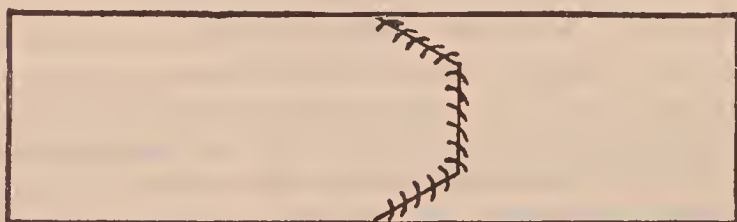
A



B



C



D

Methods of fastening the roller bandage. A, the corners of the end are turned under and a safety pin passed through it and some of the underlying layers; B, the corners of the end are turned under and a strip of adhesive plaster binds it to the layer underneath; C, the end of the bandage has been split lengthwise far enough to make two tails long enough to be tied around the part, a knot being tied at the bottom of the slit to prevent further tearing; D, the corners of the end are turned under and a few stitches taken between it and the underlying layer. (*From Colp and Keller.*)

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places where they can reach it and open it, or where they might injure themselves upon it. Likewise, irrational patients are liable to interfere with this fastener.

2. Adhesive Plaster.—This is unobtrusive and neat but it is not as secure as the safety pin and will not, therefore, answer for some pressure bandages. Also, it cannot be used for a bandage over a wet dressing nor in any other case where the bandage is likely to become wet, as in the instance of the Carrel-Dakin treatment.

3. Tying.—This is a rough-and-ready method which can always be resorted to in the absence of other means. To fasten the bandage by this method, tear or cut it down the middle of the end, tie a knot at the bottom of the slit to prevent further tearing, and then tie these strips around the part. The student should learn this method but she should immediately store it away for emergency use only, as it is almost never comfortable to the patient because of the fact that if it is tight enough to hold the bandage in place it will cause a line of stricture.

The Esmarch bandage is an exception to this case in that tying is about the only suitable method for it. The rubber will not, of course, be split to make the strings, for tapes are usually cemented to one end for the purpose. If these are lacking, however, a few turns of a gauze bandage, a piece of tape, or anything similar may be fastened about the terminus of the Esmarch. The above-mentioned objection to tying does not enter into this case because the rubber is rigid enough to dissipate the objectionable pressure of the string.

4. Sewing.—This method is applicable where greater strength is needed, or in the case of children or irrational patients. It goes without saying, of course, that great caution is necessary in sewing a bandage on a patient.

(b) *The Triangular Bandage*

The safety pin, tying of the corners, or both, will cover all cases for this bandage.

(c) *The Many-Tailed Bandages*

Tying of the ends or safety pins will answer for the head and chin bandages, but for the other parts safety pins are all but indispensable.

MISCELLANEOUS BANDAGING RULES

1. Never bandage two surfaces of skin together—separate them with gauze or cotton, preferably non-absorbent cotton. There is always a certain amount of moisture present on the surface of the skin and if this is confined it will accumulate, and in addition to being uncomfortable it may seriously chafe the parts in time. The non-absorbent cotton keeps these

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surfaces apart and allows evaporation of the moisture, whereas absorbent cotton or gauze absorbs and retains it. This applies particularly to the fingers, toes, axilla, and the arm and chest in the case of the Velpeau bandage.

2. In all cases where surgical necessity does not contravene, *parts should be bandaged in their accustomed position*. This applies with special emphasis to the ears, which should always have sufficient padding behind them to prevent their being held more closely to the head than is natural for them. Bandages of the neck, axilla, the hand and fingers, and the toes, also call for special consideration in this respect.

3. In bandaging the hand and foot *leave the fingers and toes exposed* if possible so that they may be watched as guides to the condition of the circulation of the limb. Coldness, blueness, and swelling of the fingers or toes, or of any part below a bandage, are signs that it is too tight at some point. This accident is very largely precluded by attention to pressure in the application of the bandage, but it must not be forgotten that parts under even the most expertly applied bandage may swell later from causes entirely unrelated to the bandage itself. In the cases of the arm or leg the pulse, if accessible, at the radius or the dorsum of the foot will, of course, be a valuable guide to the state of the arterial circulation.

4. *Do not apply a wet bandage* because it will probably shrink in drying and become too tight. The plaster of Paris and starch bandages are, of course, exceptions, but they are always applied with this in mind, and a thick padding of stockinet, cotton, or Canton flannel is usually provided underneath them to guard against this danger.

5. When applying a *bandage over a wet dressing*, or over a Carrel-Dakin dressing which will eventually become wet, remember this probability of shrinkage and apply it correspondingly *loosely*.

6. If necessary to *bandage a dressing under a splint*, remember to do it *loosely* because, even though you may be able to note the condition of the part, it will be very inconvenient to correct undue tightness in this case, and durability is not important here since the splint and its bandage will give the additional security needed.

7. In *placing the reverses* of the reverse bandage, see that they are not over bony or prominent parts, such as the shin or radius, for they may become very painful because of the uneven surface they create. The line of these reverses is best placed on the outside of the leg and arm.

8. Always *apply the roller bandage from below upward*, particularly when exerting special pressure, because when put

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on in the opposite direction it allows the veins, which are eventually to be underneath it, to become engorged with blood which is thus imprisoned and may later be the cause of much discomfort and even more far-reaching trouble. Likewise, the Scultetus bandage should be fastened from below upward.

9. Make it a rule in applying the roller bandage to the extremities to *start by rolling it outward* rather than inward—that is, to bandage a right arm or leg (assuming that you are face-to-face with your patient), hold the roller in your left hand and start by rolling it toward your left side; to bandage a left arm or leg, then, you will hold the bandage in your right hand and start it toward your right. A test application will show you that observance of this rule will give you greater freedom and ease in the adjustment of the reverses and the figure-of-8's.

THE REMOVAL OF ROLLER BANDAGES

Gauze and paper bandages are rarely ever used more than once and they are therefore usually cut away. If one is



Instruments for the removal of plaster of Paris bandages—saw, knife, and heavy bandage scissors.

(From Colp and Keller's Textbook of Surgical Nursing)

equipped with the special bandage scissors, the operation is very simple, as the blunt point can be passed underneath the bandage with perfect safety, provided, of course, that the

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region of the wound is entirely avoided, as it should be in any case.

The *washable and rubber bandages* will simply be unwound, and a little practice will enable one to roll them together loosely as fast as they are unwound. Dexterity in this is really a valuable acquisition because it saves much time and avoids annoyance to the patient and confusion to the bandager.

For the removal of *plaster of Paris bandages* one needs a strong knife or saw and a pair of strong bandage scissors. There are special instruments made for this purpose and they will usually be provided in hospitals. The operation consists merely in cutting directly through the entire length of the shell in a sufficient number of places to enable one to lift the cast away with as little disturbance as possible to the patient. The lines chosen must be accessible, of



Bandage scissors. The one longer point is blunt and smooth and is designed to be passed underneath a bandage immediately on the surface of the patient's body without danger of injury during the process of cutting off the bandage—a procedure which is never safe with an ordinary pair of scissors.

(From Colp and Keller's Textbook of Surgical Nursing)

course; if possible they should be remote from the wound (if there is one); and to save labor one should select the shortest lines that will answer the purpose. Some labor may be saved in the sawing process by wetting the plaster immediately ahead of the instrument with a few drops of hydrogen peroxide, acetic acid, or bichloride solution. These solutions have a slightly solvent power over the plaster, but a little plain water answers the purpose very well also. Care should be taken not to use enough of these solutions to wet bandages or dressings underneath, and it should also be remembered that the bichloride will be very unkind to the metal instruments if exposed to them too long. The precaution should always be taken of discarding the knife or saw in favor of the scissors before this bandage is en-

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tirely severed, to escape the danger of cutting the patient. Sometimes this labor will be obviated by the surgeon who will cut the plaster just after applying it and while it is still soft. In this case the cast will be bound together by a strong bandage and its removal will then be a simple matter.

Starch bandages can usually be cut with strong bandage scissors, though if they are thick the plaster knife or saw may be needed.

BASHAM'S MIXTURE

See IRON.

BATHS

Bathing.—Baths are given for various effects and at different temperatures, but the fundamental reason is to stimulate the action of the skin, so that it can perform its various functions. By bathing—the blood circulation of the skin is stimulated—the temperature of the body is kept even—and the residue of the oily substance, with the waste matter which is brought to the surface by perspiration is removed. In most conditions a bath is refreshing to the patient and soothing to the nerves.

Temperatures of baths.

Hot bath	104-110° F.
Warm bath	99-100° F.
Tepid bath	80- 90° F.
Cool bath	70- 80° F.
Cold bath	60- 70° F.

Cool or cold baths are given for their tonic effect and also to reduce temperature. A patient should be rubbed constantly during such a bath to bring more blood to the surface to have it cooled.

Hot baths are sometimes ordered for special reasons: to cause excessive action of the skin, to relax muscles or to stimulate the heat of the body. Hot baths taken continually are enervating.

A warm bath with a non-irritating soap is the usual bath for cleansing purposes. This sometimes may be followed by a cold sponge to act as a tonic for the skin.

Soda, bran and starch baths are used to allay irritation of the skin and are given warm or tepid.

A soda bath is prepared in the proportion of 2 ounces of bicarbonate of soda (ordinary baking soda) to every gallon of water. In this case the patient should be carefully dried without rubbing to avoid irritating the skin.

A bran bath is prepared an hour beforehand by placing

BATHS

two pounds of bran in a bag (cheesecloth or some other thin material) and allowing it to soak in a tub half full of water, and squeezing the bag often. Hot water may be added immediately before the bath.

A **starch bath** is prepared thus: mix about 8 ounces of starch in a little cold water. Add sufficient boiling water to make a very thin paste and mix this with the bath water.

Salt baths are given for their tonic effect on the skin. Allow 2 or 3 pounds of salt to a tub half full of water, dissolved in hot water and then cooled to the desired temperature, which is usually cool or cold, although sometimes ordered quite warm.

General Rules for Bathing

The ideal times for bathing are in the morning or at night.

Baths should not be given sooner than $1\frac{1}{2}$ to 2 hours after eating as, by thus increasing the circulation of the skin, blood is brought from the stomach where it is needed during the process of digesting the food.

The room in which a bath is taken should be warmer than usual and without draughts.

Everything needed should be ready before beginning the bath.

Tub Bath

Uses.

- For cleanliness
- To increase temperature
- To decrease temperature
- To relax the muscles
- To soothe the nerves

Articles needed.

Chair	Soap	Wash cloths
Bath mat	1 face towel	Personal linen
	2 towels, warmed	

Method.—The room should be warm and without draughts. Place a chair conveniently near with a towel spread on it and a mat on the floor beside the tub. Fill the tub half full of water at a temperature of 90° or, if desired, the bath can be made warmer. Help the patient both in getting in and out of the tub. Use plenty of castile soap and a rough wash cloth. Rinse the skin well and, when drying, rub briskly with a warmed towel to increase the circulation. Have the patient rest for at least an hour afterwards. When a patient is taking her own bath, always stay within call in case your assistance is needed.

BATHS

Sponge Bath in Bed

Uses.

For cleanliness.

To keep the pores of the skin open.

To give comfort to patient.

To remove waste material given off through the skin.

Articles needed.

2 basins	Small blankets
1 face towel	Soap
2 bath towels	Alcohol
2 wash cloths	Powder
Personal and bed linen	

Method.—Half fill one basin with water at a temperature of 110° and the other with cooler water for rinsing.

Draw patient toward the edge of the bed. Remove the pillow entirely (to rest the muscles of the neck) or replace it with a smaller pillow if the patient prefers.

Lay a small blanket, arranged in three folds, across the chest and have the upper end of it held by the patient or tucked in around the shoulders so that while folding down the bedclothes to the foot of the bed, the other end of the blanket may be drawn with it, thus covering the patient. Then place another small blanket lengthwise on the bed, rolled close to the patient's side. Draw this beneath the body and remove the nightdress under cover.

Each part is washed, rinsed and dried separately and the body is at all times protected by a cover blanket.

In using a wash cloth, take all four corners within the hand to prevent them dripping on the patient, and wash with firm, gentle stroke. First bathe the face, wiping the eyes toward the nose. Then the neck and ears. Then bathe the arms and immerse the hands in the water and carefully clean them, using a brush and an orange stick for the nails, and when bathed wrap the arms in folds of the under blanket. Then proceed to bathe the chest, axillæ and abdomen. After drying them, turn the patient on the side and wash to the waist line, then to the middle of the thigh, and dry. Turn the patient again on the back and wash the legs, which can more easily be done by flexing the knees. Place the feet in the basin of water when bathing them and use a brush for the nails. Wash the soles of the feet with firm, steady strokes to prevent tickling and carefully bathe the pubic region unless this has been done prior to the whole bath.

If alcohol is used, rub it on each part after it is dried. Powder if desired.

BATHS

When the bath is finished, remove the under blanket, replace the nightdress, draw up the bed clothes, and remove the cover blankets. Replace the pillows which have been shaken up and if the bedding requires to be changed, this should be done at the same time that the under blanket is removed.

In case only one bath blanket can be procured, use it doubled or substitute turkish towels.

Cold Alcohol Sponge Bath

Uses.—To reduce temperature.

Articles needed.

- | | |
|---------------------------------------|--------------------------------|
| 1 basin of cold water | 1 hot water bag |
| 2 large wash cloths of rough material | 3 safety pins |
| 3 towels | 1 bottle alcohol, 95 per cent. |
| | Ice bag or cloth for head |
| | Ice (if ordered) |

Mix alcohol and water in equal parts.

Method.—Prepare the bedding and the patient as for a sponge bath, except for these details: a rubber sheet should be put beneath the under blanket so that more water may be safely used, and a loin cloth is pinned about the hips. Allow the head to remain slightly raised.

Apply an ice bag to the head, or a cloth wrung out of cold water and frequently changed. Then remove the upper blanket. Proceed to bathe the large surfaces of the body, keeping up friction which, by constant rubbing, brings the blood to the surface of the body to be cooled. Let the water evaporate; do not dry it off. The only part which cannot be vigorously rubbed is the abdomen or any tender spot.

Half the time ordered for the bath (usually 15 or 20 minutes) is given to sponging the front of the body; the remainder is spent on the back with the patient turned on her side.

To remove the patient from the bath.—Remove the cold application from the head. Place a blanket over the body and remove loin cloth and under blanket by rolling them close to the patient's side and slip another blanket in their place at the same time. Turn the patient on to it. Draw up the upper bedding and place a hot water bag near the feet. Give hot broth to drink and at the end of half an hour remove the blankets and hot water bag, replace the nightgown and take the temperature, pulse and respiration.

BEDBUGS

Foot Bath

Uses—in general.

To relieve congestion, by increasing general circulation.
To draw blood away from the head.

Articles needed.

Foot tub and water	Pitcher with additional hot
1 rubber sheet	water
3 towels	Hot water bag with cover
1 blanket	Bath thermometer
	Mustard

Foot bath for patient in sitting position.—Patient should recline in a comfortable chair. The bath is prepared in a foot tub at a temperature of 105°. Place the rubber sheet on the floor to protect the rug; fold the blanket in half, placing one end under the knees so that the patient is sitting on it. Then move the tub in position, having a thermometer in the water or testing heat with your elbow. Lower the feet gently into the water and cover with the other end of the blanket, lifting one corner occasionally to add hot water. This should be done gradually until the temperature reaches 110°. When mustard is added (one tablespoonful to a gallon of water) a lubricant should be applied to the soles of the feet to prevent irritation.

When finished, withdraw the tub, dry the feet and leave them wrapped in a blanket or apply a hot water bag for a few minutes.

Note.—Mustard should be mixed to a thin paste in cold water and thoroughly stirred into the bath.

Foot bath in bed.—Flex the patient's knees and turn the bed clothes back from the foot of the bed over them; lay the extra blanket into a simple envelope or fold, one side of which rests on the bed under the tub while the other is drawn up over the legs and tub. Continue the bath as described above. It will be found more convenient to let the tub lie lengthwise on the bed, with the edges covered by a folded towel to protect the legs from touching the edge.

BEARBERRY

See UVA URSL.

BED IN LABOR

See LABOR, MANAGEMENT OF.

BEDBUGS

See LICE.

BED-MAKING

A closed bed.—In making a bed see that it has been freshly aired and that the mattress is turned. A light pad or blanket should be provided to protect the mattress. Over this should be spread the **under sheet**, the wide hem to the top and a greater surplus left to tuck in at the head than at the foot of the bed. Tuck the sheet in first at the head of the bed, then at the foot of the bed and then down one side; going to the other side of the bed, pull the sheet snugly across, tucking it in firmly and seeing that the corners are neatly squared.

All sheets and blankets must be placed with the center fold to the center of the bed so that they will not wrinkle when stretched to be made tight.

If it is necessary to protect the mattress, a rubber sheet may be placed over the under sheet and tucked in at both sides before the draw-sheet is spread.

The draw-sheet is tucked in firmly on one side, then stretched and tucked in on the other. If a double sheet is used for this purpose, the fold must be towards the top of the bed.

The upper sheet should be placed with the wide hem at the top, right side down so that when the sheet is turned back over the bedding the smooth side of the hem will be uppermost. The edge should just reach the top of the mattress, leaving the remainder to be tucked in at the foot. The lower corners should then be squared and tucked in.

Each **blanket** is put on like the top sheet, but not nearer than 12 to 14 inches to the head of the bed. When the blankets are adjusted, the top sheet is turned back over them and tucked in down the sides loosely. Over all is laid a light **spread** stretched evenly to the top of the mattress and tucked in firmly at the foot, with the corners mitered or squared and the sides left hanging.

Pillows should be shaken well down into their corners then flattened out and placed in position; one across the bed and the other standing up on it, folding any surplus pillow slip well out of the way.

An opened bed—ready for use.—To prepare a bed for a patient: (1) slip one hand under the mattress and raise it slightly while pulling the upper bedclothes out with the other. Loosen the bedding in this manner from both sides of the bed. (2) Fold the spread under the top of the blanket and then fold the upper sheet down over this. (3) Then, facing the foot of the bed, fold the clothes back in parallel plaits across the bed to its foot, where they re-

BED-MAKING

main until needed to be drawn up over the patient. The pillows are arranged one on top of another.

To Change Bedding with Patient in Bed

To replace the upper sheet only.—Spread the clean sheet across the bed after removing all but one blanket and the soiled top sheet. These may be drawn away under the new covering and the outer bedding replaced and tucked snugly in at the foot and sides with the corners carefully squared.

Sheets are more often changed than blankets in making a bed fresh so that ordinarily the spread and top blanket may be completely removed while the change is being made.

To remove top bedding.—When necessary for any purpose to do this, place a folded light blanket over patient's chest, loosen the bedding at the foot and fold it back as far as the patient's knees; the bedding at the top is then turned down over this in one deep fold, drawing the blanket with it, then the sides one after another are folded over making a square. This can be readily removed and replaced, unfolding the square in the same manner.

To change the under sheet.—Remove the upper bed-clothes as described. Then, steadying the mattress with one hand so that the patient is not disturbed, loosen the under sheet and the draw-sheet. Draw or turn the patient to one side of the bed and fold back the soiled lower sheet close to the body. Then spread the clean sheet smoothly over the side of the mattress which is clear, leaving the greater length at the top and taking care that the center fold of the sheet is in the center of the bed. Tuck in tightly at the head and the foot, then along the side. Put the draw-sheet in place and tuck in on the side, bringing the rest of it with the surplus of the lower sheet close to the patient's body; then go to the other side of bed and turn the patient away from you on to the clean sheet. Remove the soiled ones and spread the remainder of the clean sheets over the mattress, tucking them in securely under the remaining sides and ends.

If a patient cannot well be turned, the knees may be flexed and the lower bedding drawn under the body at the hips, after which the shoulders and legs may be alternately raised while the bedding is made smooth underneath.

To change a draw-sheet.—Fold the upper bedding back a little, loosen the soiled draw-sheet, folding it closely to the patient's side. Replace this with a fresh draw-sheet, tucking it in on the side nearest you and spreading the rest smoothly. Turn the patient back on this fresh sheet

BED-MAKING

and remove the soiled one, drawing the remaining half of the clean sheet across the bed and tucking it in securely.

The chief advantage of a draw-sheet, aside from the protection it affords the bed, is the ease with which it can be changed.

To change a draw-sheet when a rubber sheet is used, fold, spread over the bed and tuck in both together.

To change bedding when only one rubber sheet is available.—Loosen bedding on one side, fold draw sheet close to patient's side, lay rubber sheet back up over the patient's body, then fold lower sheet close to patient's side and spread the clean under sheet. Bring down the rubber, lay in clean draw-sheet and tuck it in, turn patient over, remove soiled draw-sheet, lay rubber back over patient's body, remove soiled under sheet. Draw over and tuck in the clean one. Bring down rubber and spread the clean draw-sheet and tuck them in together.

In folding sheet in lengthwise plaits, as frequently directed, divide it into an uneven number of folds with the free edge topmost and nearest the side to which it is to be drawn. This makes quicker and smoother arranging possible.

To change the mattress with a patient in bed.—The mattress may be changed with a patient in bed by removing the upper bed clothes, leaving just a light weight cover over the patient. Have two or three chairs on the far side of the bed on to which the mattress can be slipped. Draw the patient to the side farthest from the chairs and slip the mattress half off on to them with the patient still lying on it. Place three pillows on the springs for a temporary mattress and draw the patient back on them. Go to the far side of the bed, remove the sheet and turn the mattress over (from the head to the foot), then replace it half over the wire springs. Spread a fresh under-sheet and draw-sheet over the mattress and tuck in on one side. Lift the patient back on to it, remove the pillows, and draw the mattress into position. Tuck in the remainder of the lower sheets and replace the upper bedding and pillows.

To change the patient to another bed.—Have a freshly made bed of corresponding height conveniently placed with the upper bedding folded back to the foot. Draw the patient to one side of the bed, loosen the draw-sheet and fold this over the patient while removing the upper bedding. Bring the two beds together and, going to the free side of the fresh bed, take the upper ends of the draw-sheet and the pillow (on which the head and shoulders rest) in one hand, and the lower end of the draw-

BED-MAKING

sheet in the other, and draw the patient carefully over to the other bed. Draw up the upper bedding, remove the draw-sheet and change the pillow.

Note: This is more easily accomplished with an assistant.

To relieve the weight of bed clothes.—If there is a foot rail or board to the bed, the weight of the bed clothes may be taken from the body by being drawn over the foot of the bed and fastened securely either under the mattress or around the foot rail. The corners and sides should be folded diagonally and pinned to exclude any draught. If the bed lacks a foot board a high back chair may be used as a substitute, or a cradle which comes for the purpose and extends across the patient's legs beneath the bedding. Various substitutes may be improvised to keep the weight of the clothing off the body, such as a box with two sides knocked out.

To prevent slipping down in bed.—1. One method of preventing slipping down consists in a board like a swing seat which may be placed upright against the feet. The tapes or cords at its sides are drawn tight and fastened to the head of the bed low down. The board should be deep enough to support the bedding and wide enough not to interfere with the moving of the patient's feet, and should have a small, hair pillow placed against it as a foot rest.

2. A sheet folded diagonally into 12-inch plaits may be used similarly, bringing it below the body so that the feet rest in its center on a small pillow, and fastening the ends securely to the sides of the bed.

3. Another method is simply to put a large pillow beneath the patient's knees, or for this purpose a pillow can be fastened in a roll with tapes running through the center of the roll and these tied to the sides of the bed, thus keeping the pillow in position under the knee.

Arrangement of pillows. Pillows, if well arranged, mean comfort to the patient, and the particular parts needing support in general are:—(1) **head and neck**, (2) **shoulders**, (3) **arms and elbows**, (4) **small of the back**.

It is easier to arrange pillows both for sitting up and when the patient can only be partly raised with the support of a bed-rest or substitute—a tray or board or a stiff hair pillow.

In changing a pillow (one under the head): have the fresh one ready on the far side of the bed. Lift the patient's head and shoulders with one arm by reaching over the body and remove with the other hand the used pillow, substituting the fresh one at the same time. Have the pillow come well under the shoulders.

BEDPAN

When **two pillows** are used, if the patient is lying on the back, have the first and lower one well beneath the shoulder blades, with the second and upper one higher on the bed to support the neck and head, but still under the shoulder blades.

When **several pillows** can be used, place the largest one nearest the patient's back and arrange the others in overlapping layers closer to the head of the bed. Slip small pillows under the elbows and neck and in the hollow of the back.

Cage pillow.—A cage pillow may be built to resemble an arm-chair. Some firm support such as a stiff pillow or a backrest should be laid against the head of the bed (place a towel to protect from marking bed). Shake the pillows well and place the two largest into an inverted **V** behind the patient's body, with the lower ends where they may support the elbows. Build two other pillows up on these in same way, bringing them closer to the body so that when the cage is complete the patient's back and arms will be completely supported. A small pillow may be added for the support of the neck and the head.

BEDPAN

Giving a bedpan.—Warm the bedpan first, then turn the bedclothes slightly back. Have the patient flex the knees. Raise the hips, draw up the gown and insert the pan at right angles to the bed, turning it so that it lies in proper position under the patient. If the patient cannot raise the hips, have pan in position, flex the knees and with both your hands raise the hips; hold with one hand and insert the pan with the other.

Removing bedpan.—Flex the patient's knees, raise the hips, and withdraw the pan in same manner as it was inserted. Cover and remove. Turn patient on the side and wash off the part.

To prevent bedsores and for the comfort of the patient it is very necessary to raise the hips perfectly clear of the pan while inserting or removing. If a patient is emaciated, it will be more comfortable to place a rubber ring partly inflated with air over the bedpan before inserting. A small pillow or a folded towel should be placed under the small of the back with the end over the edge of the pan.

BED SORES

Pressure sores are usually spoken of as **bed sores**, although they can develop under any condition where there is a constant pressure on a part, as this prevents healthy circulation.

BED SORES

This pressure may come: (1) from the body being constantly in one position; (2) from one part pressing against another; (3) from moisture and uncleanness of the skin; (4) from friction from the bedclothes or (5) from splints and bandages improperly adjusted. Paralytics and very thin or emaciated patients or those with otherwise lowered vitality are especially susceptible to this danger.

The most susceptible parts are the lower end of the spine, the buttocks, hips, heels, knees, ankles, toes, elbows and ears. When placing or removing a bedpan special care should be taken to raise the hips sufficiently to avoid rubbing the surface against the pan.

Prevention of pressure sores. Bathing and rubbing. Bathe the parts frequently. Keep the skin dry and stimulate it by rubbing, using a little lubricant on the hand and rubbing with a smooth, firm touch in circular motions. This is always to be followed by rubbing with alcohol, which leaves the skin dry, hardened, and less liable to break down. Then apply talcum or stearate of zinc powder.

Remove pressure.—If a patient can be turned, change the position frequently as the simplest way to remove pressure. If this cannot be done, the pressure must be kept away from the susceptible parts by the use of rubber or cotton rings, air pillows, or an air mattress.

For the lower part of the back, a rubber ring is necessary. This should be covered with a bandage or should be slipped into a pillow case. This ring should be only partly inflated, otherwise it will be hard, uncomfortable, and may itself cause irritating pressure. In case of a very heavy patient, two such rings can be used, one on top of the other, both only partly inflated and tied together by a bandage or adhesive plaster. Be sure that the part to be protected does not touch the surface under the ring. To ease the consequent strain on the muscles, place a pillow in the hollow of the back. Rings made of cotton and covered with bandage, or air pillows, can be utilized to keep pressure off various parts of the body. A hot water bag partly filled with air makes a good substitute for such a pillow.

Signs of development of bed sores.—If a patient complains of stinging when rubbed with alcohol, stop the use of alcohol at once as this sensation indicates that the skin is nearly broken. Apply stearate of zinc powder or oxide of zinc ointment over the part. Remove all pressure and rub around the part towards the wound and not away from it. This will improve the general circulation at that part.

Always notice the least sign of redness of the skin.

BEER

Bed sore wound.—Report the first sign of a bedsore to the physician. When a sore has formed follow orders as to dressing, etc. It should be treated as any wound, but particular care must be given to those developing around the hips and buttocks in order to prevent fecal matter or urine from infecting them. Remove all pressure.

If the skin is reddened or sore from pressure from splints or bandages these must be readjusted and the skin rubbed with alcohol and alum (to harden it) and well powdered.

A patient who is constantly sitting in a chair requires care to prevent pressure sores. Rubber rings and air or soft hair pillows can be adjusted to relieve such pressure, and the arms of the patient must also be protected in many cases by the same method. Patients suffering from any form of paralysis are very susceptible to this danger.

BEER

See ALCOHOL.

BELLADONNA AND ATROPINE

Belladonna is a drug obtained from the leaves and roots of the *Atropa belladonna* or **Deadly nightshade**.

Its active principles are the following alkaloids: **Atropine**, **Hyoscyamine**, and **Hyoscine**. The effects of belladonna are due principally to the atropine which it contains. This is preferred for internal use.

Appearance of the Patient

After administration of atropine, belladonna or hyoscyamus, the following effects result within ten minutes to a half hour:

The patient looks brighter, the face and neck are somewhat flushed, and the pupils are dilated. He is more wakeful and brighter.

The pulse is rapid and strong and the breathing is deeper and faster. Various cramp-like pains, such as pains in the stomach, intestines, or bladder, from which the patient may be suffering, are relieved.

The patient is thirsty, complains of dryness of the mouth and throat. The skin usually feels dry, and may be quite red.

If the patient has an attack of shortness of breath, this is usually relieved.

Action

Local action: On the skin, atropine relieves pain, and checks the secretion of sweat. This effect is produced by paralyzing the sensory nerve endings in the skin. It is

BELLADONNA

often used for this purpose in the form of a belladonna plaster. Atropine or belladonna is readily absorbed from the skin if applied in a solution of alcohol, glycerin, oil, or camphor, or in the form of plaster. It often causes general, even poisonous symptoms from such applications. **On mucous membranes:** It checks the secretion.

In the mouth: Atropine has a bitter, burning taste, and checks the secretion of saliva and mucus. It makes the mouth and throat feel dry. If this effect is marked, the patient is unable to swallow.

In the stomach: It lessens the secretion of gastric juice and the peristalsis of the stomach.

In the intestines: Atropine checks the secretion of the mucous membrane of the intestines and lessens the peristaltic contractions of its muscle wall. It is often used for this purpose to check the griping pains of cathartics.

Action on the heart: Atropine makes the heart beat faster and stronger.—The systoles, or periods of contraction of the heart are increased, while the diastoles or periods of relaxation are lessened. The heart then expels more blood; and with greater force.

Action on the blood vessels: The small arteries of the abdomen are constricted by the contractions of their muscle fibers. **The blood vessels of the skin, however, are widened.** This causes flushing of the face and neck.

Atropine makes the pulse rapid, strong, and tense. There may be a slight increase in blood pressure.

Action on the respiration: Atropine makes the breathing faster and deeper; more air, and therefore more oxygen, is taken into the lungs. The blood is then able to take up more oxygen and to eliminate the carbon dioxide more rapidly.

Action on the nervous system: Atropine increases the activity of the brain; this produces wakefulness and restlessness. The higher intellectual activities, such as reasoning and memory are not affected, however.

The patient is more active and more talkative, because the motor and speech areas of the brain are more active, and these areas are constantly sending out more impulses.

In overdoses, atropine causes symptoms of lessened brain activity (depression), because the brain then becomes exhausted from overactivity.

Action on the secretory glands: Atropine lessens the secretion of all the secretory glands except the kidneys.

Action on the involuntary muscles: Atropine lessens the contractions of all the involuntary muscles, by paralyzing the nerve endings of the nerves which carry impulses to these muscles. Thus, the peristalsis of the stomach and intestines,

BELLADONNA

the contractions of the bladder, of the uterus, and of the bronchial muscles are all lessened by atropine.

Action on the pupil: Atropine dilates the pupil by paralyzing the nerve endings of the nerves in the circular muscle fibers of the iris. The pupil may remain dilated for days.

Effect on the temperature: In large doses atropine often causes a rise of temperature.

Excretion

Atropine or a drug containing atropine, is excreted mainly by the kidneys, in about ten to twenty hours.

Idiosyncrasies

The following unusual effects occasionally occur:

1. Ordinary doses of atropine sometimes cause delirium.
2. When applied to the conjunctiva of the eye, atropine often causes inflammation of the eyelids and face.
3. The rash caused by atropine may spread all over the body, and may be mistaken for scarlet fever.

Poisonous Effects

Dangerous symptoms have resulted from $1/20$ to $1/10$ of a grain and death has occurred in about six hours after it was taken.

Symptoms.—In giving atropine or atropine containing drugs the nurse should watch for **excessive thirst** and **talkativeness**. She should report these symptoms to the physician as soon as they occur.

The earliest and most characteristic symptoms of atropine poisoning are the following:

1. **Dryness of the mouth and throat.**
2. Excessive thirst.
3. Difficulty in swallowing.
4. Hoarseness.
5. **Flushed, dry skin**, especially of the face and neck.
6. **Very rapid pulse and breathing.**
7. **The pupils are widely dilated** and near objects cannot be seen distinctly.

If very large doses of atropine are taken, these symptoms are increased and may be followed by:

1. Hoarseness, with difficult and indistinct speech, and talkativeness.
2. Restlessness and wakeful delirium.

The patient is very talkative, but his ideas are confused. He may begin a sentence and not finish it. He is very light-headed, may burst into fits of laughter or tears. Occasionally there may be illusions or hallucinations of sight.

Soon a **peculiar, wakeful, active, and talkative delirium** develops. The excitement is usually followed by collapse:

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the skin becomes pale, cold and clammy, the pulse becomes rapid and weak, the breathing slow and shallow, and death may result. Frequently the excessive excitement is followed by stupor and coma, with slow and shallow breathing and cyanosis. Finally, tremors of the muscles and **convulsions** develop, the breathing becomes slow and shallow, the face becomes blue, and the patient dies from paralysis of respiration.

Although atropine is a respiratory stimulant, the nurse should remember that from poisonous doses the respiratory center becomes depressed and may finally be entirely paralyzed and death ensue.

Treatment of Atropine Poisoning.—1. Wash out the stomach, or give emetics.

2. Give tannic acid or old tea to combine with the atropine and neutralize it.

3. Catheterize the patient, to avoid reabsorption of the atropine from the urine in the bladder.

4. Keep the body warm; give mustard baths.

5. Give artificial respiration if the breathing is embarrassed.

6. Stimulants, such as caffeine or strychnine, are usually given.

7. **Do not give morphine**; for, while atropine is the antidote for morphine, the dangerous effects of atropine are due to the exhaustion of the breathing. If morphine is given in such cases, the breathing is only made slower.

Uses

The following are the most important uses of atropine or belladonna:

1. In the form of a belladonna plaster or liniment, to relieve pain.

2. As a cardiac and respiratory stimulant, especially where immediate effects are desired.

3. As an antidote for morphine poisoning. It is very often given together with morphine to avoid poisonous effects.

4. To check secretions, for example, to check profuse sweating, or the secretion of milk.

5. To lessen cramp-like pains produced by contraction of involuntary muscles. **It is often prescribed together with purgatives to lessen their griping. It relieves the colic** which is produced by the contractions of the involuntary muscles of the bile ducts resulting from the passage of a gall stone along these ducts. It also relieves the colic of the ureters of the kidney (renal colic) resulting from the passage of a stone or other substance along the ureter.

BENZOIC ACID

It frequently relieves painful urination produced by the spasmodic contractions of the involuntary muscles at the neck of the bladder.

6. Atropine is very often used to relieve bronchial asthma.

7. Atropine is very often used to dilate the pupil, so that the retina or background of the eye may be more easily examined, and to prevent adhesions between the iris and lens, when the iris is inflamed.

8. It is very often used in diabetes in large doses. It lessens the amount of sugar in the urine.

Preparations

Extract of Belladonna Leaves; dose $\frac{1}{12}$ to $\frac{1}{2}$ of a grain.

Tincture of Belladonna Leaves; dose 5 to 15 minims.

Belladonna Ointment; this contains about 10 per cent. of the extract of belladonna.

Belladonna Plaster; this contains 3 parts of the extract of belladonna and 7 parts of adhesive plaster.

Fluidextract of Belladonna Root; dose 1 to 2 minims.

Belladonna Liniment; this consists of the fluid extract to which has been added about 5 per cent. of camphor.

Preparations of Atropine

Atropine; dose $\frac{1}{160}$ to $\frac{1}{60}$ of a grain.

Atropine Sulphate; dose $\frac{1}{160}$ to $\frac{1}{60}$ of a grain.

For hypodermic use, atropine often comes in tablets, each containing the required dose, or in $\frac{1}{2}$ to 1 per cent. solutions.

Oleate of Atropine; this contains about 2 per cent. of atropine.

Homatropine

Homatropine is an artificial alkaloid of atropine. The effects are similar to those of atropine. It dilates the pupil more rapidly than atropine, and the effect is not as lasting. It is not so apt to cause general symptoms as easily as atropine from its local use; as in applications to the eye. Homatropine is used principally to dilate the pupil, by dropping a solution of the drug into the conjunctiva of the eye.

Preparation

Homatropine Hydrobromide; dose $\frac{1}{100}$ to $\frac{1}{60}$ of a grain.

This is used principally in $\frac{1}{2}$ to 1 per cent. solutions for local applications to the eye.

BENZOIC ACID AND ITS SALTS

Benzoic acid is an organic acid obtained from benzoin; the hardened sap of the *Styrax benzoini*, a Peruvian tree.

Local action: Applied to the skin or mucous membranes

BENZYL BENZOATE

benzoic acid acts as an antiseptic. It also increases the secretion of all mucous membranes.

Internal action: When taken internally, benzoic acid or its compounds check the growth of bacteria in the intestines.

It is eliminated by the urine, which it slightly increases. It acts as an antiseptic along the urinary tract. It is excreted as hippuric acid, which makes the urine more acid in reaction.

Preparations

Benzoic Acid; dose 5 to 15 grains.

Sodium Benzoate; dose 5 to 30 grains.

This is used principally as a urinary antiseptic. It is also frequently used as a preservative for canned foods.

Ammonium Benzoate; dose 5 to 30 grains.

Lithium Benzoate, dose 5 to 30 grains.

Benzoin

This is the thickened sap obtained from the **Styrax benzoini**, a Peruvian tree. Its compounds are used principally to increase the secretions in the lungs, and in inflammations of the nose and bronchi.

Tincture of Benzoin; dose 30 to 60 minims.

Compound Tincture of Benzoin; dose, one half to two drams.

This contains benzoin, styrax, aloes and balsam of Tolu. It was formerly known as **Balsamum traumaticum**. It is contained in a number of old remedies, such as **Friar's balsam**, **Turlington's balsam**, **Jesuit's drops**, etc. It is frequently given by inhalation for inflammations of the larynx and bronchi. Benzoin is also contained in the balsam of Peru and balsam of Tolu.

BENZOIN

See BENZOIC ACID.

BENZOL

Benzol is an oily liquid made from coal tar. It is given in capsules in doses of 10 to 15 grains in the treatment of leukemia (a disease in which the number of white corpuscles is very greatly increased). Benzol must not be confounded with benzine, an entirely different substance made from petroleum oil.

BENZYL BENZOATE

Benzyl benzoate is a colorless oily liquid formed by the combination of benzyl alcohol with benzoic acid. Benzyl benzoate may be obtained by the distillation of balsam of

BERBERINE

Peru or the balsam of Tolu. It is also present in various other balsams and in the volatile oils of various flowers.

Action.—Benzyl benzoate, like papaverine, acts principally on the involuntary muscles, but it is much more efficient. It relieves the spasm of all involuntary muscles such as those of the intestines, the gall bladder, the ureters, the bronchi and the blood vessels.

It is used principally to check the pains due to spasm in gall stone colic, kidney colic and abdominal cramps. It is also used to check diarrhea in chronic dysentery and mucous colitis and to lower blood pressure.

Administration.—Benzyl benzoate has a very unpleasant taste. It should therefore be given in a thick syrup. It is usually prescribed in the form of a thick mixture with mucilage of acacia and flavored with a syrup or an elixir.

Preparation

Benzyl benzoate; dose 10 to 30 minims.

This is a liquid which is a 20 per cent. alcoholic solution.

BERBERINE

See HYDRASTIS.

BETANAPHTHOL

See NAPHTHALENE.

BETOL

See NAPHTHALENE.

BILE DUCTS

See LIVER.

BINET-SIMON INTELLIGENCE TESTS

See MENTAL DEFICIENCY.

BIRTH

See LABOR.

BIRTH, PREMATURE

See ABORTION, LABOR.

BISMUTH

Bismuth is a crystalline metal. Many of its insoluble salts are used as medicines.

Poisonous Effects

Bismuth poisoning occasionally results when it is used for a long time; especially in the form of dressings. Such applications are more apt to cause poisonous symptoms than its internal administration.

BITES

Symptoms.—The following symptoms, which resemble those of mercury poisoning, appear very slowly:

1. Profuse flow of saliva.
2. Swelling of the gums, tongue and throat, often with destruction of the soft palate, and other portions of the mucous membrane of the mouth.
3. Vomiting and diarrhea.
4. Albumin in the urine.

The symptoms usually disappear when the dressings are removed.

Uses

Bismuth salts are used as dusting powders on the skin, as astringents, as antiseptics and to promote healing of ulcers and sinuses.

They are principally used to coat, protect and heal ulcers of the stomach, and as an astringent to check diarrhea. They are often used to lessen nausea and vomiting. The stools usually turn black when bismuth is being given. This is due to the formation of bismuth sulphide.

Large quantities of bismuth pastes are often given to coat the mucous membranes of the esophagus, stomach and intestines so as to enable an X-ray picture to be taken. The bismuth is not penetrated by the X-rays, so that the organ containing the bismuth produces a dark shadow on the picture.

Preparations

Bismuth Subnitrate; dose 5 to 30 grains.

Bismuth Subcarbonate; dose 5 to 30 grains.

Bismuth and Ammonium Citrate; dose 2 to 5 grains.

This is more injurious to the tissues than the other preparations.

Bismuth Subgallate (Dermatol); dose 5 to 20 grains.

Bismuth Subgallate Preparations

Airol (Bismuth Oxyiodogallate). This is a combination of bismuth oxyiodide and gallic acid. It liberates iodine and is used as a local application to wounds, in 10 per cent. solutions in glycerin or in a 10 or 20 per cent. ointment.

BITES AND STINGS

Snake bites if poisonous cause pain, swelling and discoloration within a few minutes—blood poisoning, prostration and collapse may follow very quickly. The treatment is to prevent the poison from entering the general circulation and to treat for shock. Several tourniquets are applied at different levels, the wound is freely incised, and bleeding is encouraged—wet cupping is sometimes used

BLACK DRAUGHT

for this purpose. The wound may be swabbed with pure carbolic or cauterized. It should never be sucked as a slight abrasion on the lip would allow absorption of the poison. Complete rest, external heat and stimulants are necessary to counteract the shock. The tourniquets are removed one at a time (the one nearest the body first) if no symptoms of general poisoning appear.

Poisonous bites from spiders are treated in the same way. The poison from stings of bees or wasps, etc., is acid and may, therefore, best be treated by alkaline solutions such as ammonia water, bicarbonate of soda, soap and water or a paste made of baking soda. The sting if left in should first be removed. This can be done by pressing firmly on the tissues around the wound with a round, hollow object such as a key. Cold or hot compresses moistened with an alkaline solution may be applied—hot applications are frequently more soothing. Shock may be severe when stings are caused by a swarm of bees. Bromides and morphine are given to relieve pain and nervousness.

When the bites result in severe itching a weak solution of carbolic acid relieves it, due to its anesthetic effect on nerve endings.

BLACK DRAUGHT

See SENNA.

BLACK DROP

See OPIUM.

BLACK WASH

See MERCURY.

BLADDER

The bladder is a hollow muscular organ situated in the pelvic cavity behind the pubes, in front of the rectum in the male, and in front of the anterior wall of the vagina, and the neck of the uterus, in the female. It is a freely movable organ, but is held in position by ligaments. During infancy it is conical in shape and projects above the upper border of the pubes into the hypogastric region. In the adult, when quite empty, it is placed deeply in the pelvis; when slightly distended, it has a round form; but when greatly distended, it is ovoid in shape and arises to a considerable height in the abdominal cavity. It is customary to speak of the widest part as the *fundus*, and the part where the bladder becomes continuous with the urethra as the neck. It has four coats: Serous, muscular, areolar and mucous.

Function.—The bladder serves as a reservoir for the

BLADDER IRRIGATION

reception of urine. When moderately distended, it holds about one pint.

BLADDER INSTILLATION

In the treatment of cystitis, various antiseptic solutions—silver nitrate, argyrol, potassium permanganate, etc.—are sometimes introduced into the bladder as a local application to the mucous lining, in order to prevent the development of bacteria and decomposition of urine.

The drug ordered may be introduced after the bladder has been emptied by catheterization, or a bladder irrigation may precede the treatment.

In any case the preparation is the same as for a bladder irrigation. In addition, a sterile measuring glass containing the drug will be necessary. Before pouring the drug into the sterile measuring glass, wipe off the rim of the bottle with alcohol and do not touch the glass with the bottle or anything else unsterile.

When the patient has been catheterized or the bladder irrigated, without removing the catheter or funnel pour the drug into the funnel and allow it to flow slowly into the bladder. Finish as for a catheterization. Note whether the instillation caused the patient any pain; if so, a weaker solution will probably be required.

See BLADDER IRRIGATION, and CATHETERIZATION.

BLADDER IRRIGATION

A bladder irrigation is used when a patient is suffering from *cystitis*.

Cystitis is inflammation of the mucous lining of the bladder.

Causes of Cystitis.—The *direct* cause is the presence of micro-organisms in the bladder. The organism may be the tubercle bacillus, the gonococcus, the colon bacillus, the staphylococcus pyogenes or the bacillus typhosus, etc. It may be carried to the bladder with the urine from the kidneys or the blood stream, or it may enter from the urethra or the external genitals.

The *predisposing* causes are (1) tumors; (2) calculi and other foreign bodies; (3) urethral inflammation or obstruction; (4) injury; (5) exposure to cold; (6) atony, as in old age, resulting in retention and decomposition, or anything which interferes with the normal flow of urine; (7) paralysis as in paraplegia, etc.

The *urine* in cystitis may have a fetid odor, due to the action of bacteria, or the odor of ammonia, due to decomposition of urine in the bladder. It may be cloudy or turbid, due to the presence of the products of inflammation,

BLADDER IRRIGATION

and may contain a large amount of mucus, many leucocytes, and epithelial cells, blood, pus, and calculi or gravel.

The purposes of the treatment are:

1. To cleanse or remove accumulated mucus, pus and other irritating products of inflammation and decomposition.
2. To relieve pain, inflammation, and congestion.

Bladder Irrigations are Contraindicated in the Following Conditions:

1. In acute cystitis, until the acute stage has subsided, as the lining is so very sensitive.
2. In acute urethritis, to avoid spreading the infection to the bladder.

The Procedure.—The *Articles Required*.—These will depend somewhat upon the technique used. In addition to those used for catheterization, the following articles will be required: a sterile pitcher containing the sterile solution ordered and covered with a sterile towel, a receptacle for the return (a douche pan may be used), and a sterile glass funnel attached to the catheter to be used. Rubber catheters are always used. Sterile draping is always advisable for a bladder irrigation. The treatment is much more complicated and prolonged than catheterization. It is also required less frequently, so that nurses may not have sufficient practice to develop the skill necessary before sterile draping can, with safety, be dispensed with.

The *solutions* commonly used are: boric acid, 2 to 4 per cent., and sodium chloride one dram to a quart. Sodium chloride is stimulating; it cuts mucus and is cleansing, and it is less irritating than plain water. Other antiseptic solutions are sometimes used, such as potassium permanganate, bichloride of mercury, formalin, argyrol, and silver nitrate.

The *temperature* of the solution for cleansing purposes should be near that of the interior of the body (the average temperature of the blood being 102° F.), as the mucous lining of the bladder is extremely sensitive to temperatures either much above or below that of the interior of the body. The temperature should be from 104° to 106° F.; if cool or hot it will cause marked contraction of the bladder wall with considerable pain.

The *amount of solution* used varies, as the treatment is continued until the return is clear. Usually two or three pints are necessary.

The *position and preparation* of the patient will be the same as for a catheterization. In this treatment it is exceedingly important that you should avoid the slightest chilling of the patient, allowing as little exposure as possible. Cold is one of the predisposing factors in cystitis and chilling may bring on an acute attack with very dis-

BLEEDING FROM STOMACH

trekking symptoms. Therefore, see that the feet and body are kept warm by using blankets. If the treatment is given with the douche pan under the patient for the return, see that it is not placed under her before necessary, and see that it is well padded or protected as the treatment is rather lengthy. The douche pan should be warm.

Method of Procedure.—Strict asepsis must be observed throughout. First empty the bladder by catheterization, using the rubber catheter with the funnel attached, inserting the catheter with the utmost care and gentleness. Hold the funnel so that it will not be contaminated by contact with an unsterile surface. A long tube is unnecessary as no force should be used.

After the bladder is emptied, the solution is poured into the funnel and allowed to run in slowly, with little force. The amount allowed to enter the bladder before siphonage varies from about 1 to 4 ounces, but the usual amount is about four ounces. When the bladder is very sensitive or when much contracted, sometimes it is impossible to introduce even one ounce without causing distress. Again when it is desired to distend the bladder completely, one pint may be injected before siphonage in order to smooth out the lining (which is arranged in folds when the bladder is empty or contracted) so that the solution will reach and cleanse all parts. This is usually not permitted without express orders from the doctor. As soon as the desired amount has been introduced and before the funnel is empty, it should be allowed to pass out immediately, allowing the bladder to empty itself normally and not pressing upon the lower abdomen to hasten its discharge. Before the bladder is quite empty, that is, before the return ceases to flow, introduce more solution so as to avoid the irritation which will result from the continued strong contraction of the bladder upon itself.

This flushing of the bladder is continued until the return is clear. Finish as for a catheterization.

See CATHETERIZATION.

BLAUD'S PILLS

See IRON.

BLEACHING POWDER

See CHLORINE.

BLEEDING

See HEMORRHAGE.

BLEEDING FROM STOMACH

See HEMATEMESIS.

BLOOD PRESSURE

BLOOD PRESSURE

The normal blood pressure is as follows (Cabot): Systolic (blood is streaming into the arteries) 110-135 mm. Hg.; Diastolic (the arteries are closed off from the heart) 60-90 mm. Hg. The blood pressure is less in women than in men and lower still in children—90 to 110 mm. Hg., and in children under two years 75 to 90 mm. It is usually higher in old age. In disease, for instance, in nephritis, it may be 200 mm. and more.

The *sphygmomanometer* is an instrument for accurately measuring the blood pressure by determining the exact pressure necessary to compress and obliterate the pulse. There are several forms of apparatus which may be used.

BLOOD, TEST FOR

See URINE.

BLOOD, TRANSFUSION OF

See TRANSFUSION.

BODY LICE

See LICE.

BORAX

See BORIC ACID.

BORIC ACID AND BORAX

Boric or boracic acid is a weak acid formed by the action of sulphuric acid on borax.

Local action: Applied to the skin or mucous membranes, boric acid checks the growth of bacteria, but does not destroy them (antiseptic). It is also soothing to the skin.

Boric acid is rarely used internally, but when it is given, it increases the flow of urine.

Poisonous Effects

The irrigation of abscess cavities, the pleural cavity and other cavities of the body with boric acid, has occasionally caused the following symptoms:

1. Abdominal pain.
2. Nausea, vomiting and diarrhea.
3. Headache and dimness of vision.
4. Collapse; rapid, thready pulse, slow, shallow breathing and subnormal temperature.

Death may result from the collapse.

Continued use of boric acid, even in the form of wet dressings, causes scaly skin eruptions such as eczema, and baldness.

BRADFORD FRAME

Uses

Boric acid is used as an antiseptic for mucous membranes such as the conjunctiva. It is especially valuable as a mouth wash and gargle because of its mild action, and it is the principal ingredient of most mouth washes. It is also used to irrigate wounds and abscess cavities.

Preparations

Boric Acid (Boracic Acid); dose 5 to 15 grains.

For external use 2 to 5 per cent. solutions are employed.

Sodium Borate (Borax); dose 5 to 15 grains.

Boroglycerin (Glyceritum Boroglycerini).—This is a compound formed by heating boric acid in glycerin. It contains 31 per cent. of boric acid.

Liquor Antisepticus

This is a compound containing 2 per cent. of boric acid together with benzoic acid, thymol, eucalyptol, oil of peppermint and oil of thyme. It is marketed under the name of **Glycothymoline**.

Dobell's Solution

This contains $1\frac{1}{2}$ per cent. of borax, carbolic acid, sodium bicarbonate, glycerin and water. It is used as an alkaline gargle and as an antiseptic nasal douche.

Boric Acid Ointment

This contains 10 per cent. of boric acid.

Listerine

This is a compound containing $2\frac{1}{2}$ per cent. of boric acid, together with benzoic acid, thymol, eucalyptol, oil of wintergreen, oil of peppermint, tincture of baptista, alcohol and water.

BOROGLYCERIN

See BORIC ACID.

BRADFORD FRAME

The Bradford frame is used to restrain children in the treatment of fractures and diseases of the spine, hip and other joints. It may be used for restraint after operations, to relieve pressure on bedsores or wounds of the back and to protect dressings on the back or thighs from soiling by the involuntary passage of urine or stools.

The frames are made of gas piping and vary in length and width according to the child. They should always be about a foot longer than the child and wide enough to avoid contact with the shoulders. Two pieces of canvas

BRADYCARDIA

are stretched across the frame and stitched securely to it. A space is left between the upper and lower strip wide enough to leave the buttocks free and allow the use of the bedpan. The frame and canvas are covered with a sheet. The child is placed on the canvas with the buttocks directly over the space. Strips of canvas or other stout material are fastened to either side of the frame and are laced over the body of the child, holding him securely to the frame. The length of the strips varies with the case and the restraint required. They may extend from the axilla to the ankle or from the axilla to below the crest of the ilium with separate strips to restrain one or both legs. A cotton ring should be placed under the heel of the restrained limb to prevent pressure sores. The frame may be fastened to the sides of the bed. When used to prevent soiling of dressings from urine, etc., the frame is suspended from the sides of the crib and the bedpan is left on the bed under the buttocks. The lower canvas should be protected by a rubber. When used to prevent pressure the frame is suspended and the canvas adjusted so as to leave the wound or tender spot free from contact with the canvas or bed. The mattress of the bed may be covered with a rubber sheet or spread. The child is covered with the usual bedclothes.

BRADYCARDIA

When the rate of the pulse is abnormally slow or infrequent the condition is called *bradycardia* (slow heart.) A slow pulse usually occurs in exhaustion after severe exercise and in convalescence following acute diseases, in toxemia—auto-intoxication, uremia, and jaundice (bile in the blood poisons and weakens the muscle of the heart); in some cases of hysteria and melancholia; in accidents, such as a fracture of the skull causing pressure on the base of the brain; in irritation or pressure on the vagus nerve which slows the pulse rate; in increased intracranial pressure, as in apoplexy and meningitis, and as a result of the action of drugs, such as opium, which depresses the nervous system, and digitalis, which stimulates the vagus nerve and therefore slows the heart beat.

BRAIN, SURGICAL CONDITIONS OF

Brain Abscess

Occasionally, septic complications, or intracranial supuration may follow compound fractures of the skull, cerebral injuries, infections of the middle ear, and disease of the mastoid antrum. The diagnosis is sometimes very difficult, and the treatment is dependent upon the location of

BRAIN, SURGICAL CONDITIONS OF

the focus. As for abscesses in other parts of the body, the immediate indication is drainage. In the brain abscess this presupposes a craniotomy with drainage of the abscess cavity.

If the abscess is due to a suppurating middle ear, the treatment is a little more involved. To begin with, if pus is present in the middle ear, it must be freely drained by incising the drum. This is often done under gas, and the tympanic membrane incised by a small, spear-like knife. Some surgeons are not in favor of syringing the ear in the beginning, but keep the drainage free by wiping the meatus clean with cotton several times a day. Others prefer to have the ear syringed almost immediately with warm boric acid solution at least three times a day.

Mastoiditis and Sinus Thrombosis

If the pus spreads from the middle ear it frequently causes an infection of the mastoid cells (mastoiditis); if it enters the region of the lateral sinus (really a vein running in a groove of the temporal bone) a sinus thrombosis may result. These conditions are treated by surgical intervention.

Ante-operative Treatment.—The hair in the region of the ear should be shaved for a considerable extent, and if the jugular vein is to be ligated, the neck should always be very carefully prepared.

Operation.—The operation consists in laying open and gouging out the mastoid cells, and if sinus thrombosis is present, an exposure of the lateral sinus. In case the sinus is involved before it is incised, the vein into which it drains (internal jugular) is ligated in the neck. The reason for this is to prevent the spread of infection down the jugular vein into the general circulation. After the vein has been ligated, the sinus is incised, the clot removed by careful flushings with warm saline solution, and the sinus packed.

After-Treatment.—Patients suffering from a sinus thrombosis are very sick. As a rule, they are septic and, like all those cases, require plenty of fluid and sufficient calories to supply the energy their constitutions demand to fight the bacteria in the blood. Not only should they be given saline freely by rectum, but, if necessary, also glucose infusions of from five to ten per cent. in strength. If patients are anemic, transfusions of blood are indicated, and should be given frequently until the blood cultures are negative, or the red blood cells and hemoglobin have increased to within normal limits. The wounds are dressed daily, cleaned carefully and packed anew; the dressings are held in place by bandages.

BRAIN, SURGICAL CONDITIONS OF

Brain Injuries

The brain is enclosed within a bony case, the skull, and a severe injury inflicted upon the head may not only injure the scalp and fracture the skull, but also cause various injuries to the brain within. The immediate effect of the injury or concussion may be unconsciousness brought on by shock of the nerve centers of the brain. In addition, some blood vessels of the dura or pia mater may be torn, with a resultant intracranial hemorrhage causing compression of the brain. This manifests itself by unconsciousness, irregular respirations of the Cheyne-Stokes type, slow pulse, increasing of the blood pressure, and what is called a "choked disc" (serous inflammation of the optic nerve). This may be seen with an ophthalmoscope, an instrument through which the interior of the eye is inspected.

As these patients are in shock, they should first be treated for this condition, but they should never be placed in the shock position. In fact, the head should be elevated slightly. The room must be quiet and darkened, and all visitors forbidden. As a rule, an enema is given, and if the bladder is at all distended, a catheter is inserted, and the urine drawn off. Patients, after they have recovered consciousness, should be confined to bed for at least a week and watched very carefully, because very often peculiar mental symptoms may follow in the wake of a concussion, and it is not safe to leave such cases alone.

Treatment of Compression.—This presupposes a hemorrhage, either extra-dural or subdural. The extra-dural hemorrhage results from a rupture of one of the branches of the middle meningeal artery. Subdural hemorrhage is due to a rupture of one of the vessels of the pia mater, or a laceration of the brain with its vessels.

Ante-operative Treatment.—The head is shaved completely and iodinated. If the patient is unconscious, no anesthetic is required; if not, a little chloroform is sufficient. The head is supported on a sand bag, or small prop.

Operation.—A curved incision is made in the temporal region of the head, the temporal muscle turned down, and an opening made into the skull by means of an instrument called a trephine. This, by virtue of its circular serrated end, cuts out a button of bone. After the bone has been removed, the dura beneath is exposed. If better exposure is necessary, it may be obtained by enlarging this opening, by clipping away more bone with the bone-cutting forceps, or if the surgeon prefers to keep the bone intact, he may make two more trephine openings, and connect them with cuts made by a Gigli saw. This will remove one large plate

BRAIN, SURGICAL CONDITIONS OF

of bone that may afterwards be replaced. The clot is then removed, and the bleeding vessels are found and ligated, or special Cushing clips (small metal clips) are placed upon the artery. If the bleeding is subdural, the dura is incised, and the source of the hemorrhage sought and controlled. The dura is then closed with interrupted sutures. The bone which had been kept in warm sterile saline is replaced into the skull, as a rule, and the wound closed with or without drainage. A good tight pressure bandage is applied over the entire head.

After-Treatment.—Patients should be kept in bed for about two weeks. During this period they should be allowed very few visitors, and absolutely no excitement. They should never be left alone. If unconscious, catheterization should be performed every eight hours, and the bowels moved by enema once a day, unless incontinence is present. In these pitiable cases great care must be taken to keep the patient exceptionally clean and free from feces and urine. Unconscious patients must be turned every four hours so as to prevent pressure necroses or bed sores, which are always a bad reflection on the nursing care, although often absolutely unavoidable. If the skin, especially around the bony prominences such as the sacrum, the heels, and elbows, be carefully bathed with alcohol, gently massaged and powdered there is very little danger of this necrosis taking place, particularly if these regions are elevated for a few hours each day by inflated rubber rings. During convalescence, the patient's mind should not be subjected to any mental strain whatsoever, and the surroundings should be very quiet.

Tumors of the Brain

The brain may be the seat of a tumor either benign or malignant in nature. As the mass within the cranial cavity grows, it crowds the brain and produces signs of compression with its resultant symptoms. In addition, there will be other physical signs dependent upon the area of the brain that is infiltrated by the new tissue, or compressed by the tumor mass. If the motor area is pressed upon, there may be paralysis; if the speech area is involved, there will be paralysis of those muscles which they innervate or loss of function of the nerves supplying the organs of special sense, as the eye, ear and nose.

Treatment.—If the tumor mass is localized, an operation is done; an exploratory craniotomy is performed, and the trephine opening is made in that portion of the skull overlying the brain tumor area.

BRAND BATH

Occasionally, the tumor may be extirpated in toto, but if it is found to be inoperable, a plate of bone is removed in the temporal region, and the brain permitted to herniate against the temporal muscle. This operation is called "subtemporal decompression." Sometimes in tumors of the cerebellum, part of the occipital bone is removed, or an occipital decompression is done. This procedure temporarily relieves intracranial pressure, and with it, the terrible persistent headaches which torture these unfortunate individuals almost to distraction. Patients are confined to bed for three to four weeks.

BRAND BATH

This is the cold tub bath used in the treatment of typhoid fever. It consists in the complete immersion of the body in a bath at 95 to 85° F., or at 85 to 70° F., for from ten to twenty minutes. Some doctors prefer to use the bath at the higher temperatures given, believing that the results are better and that the shock, excitement, alarm and resistance of the patient to the extremely low temperature may do harm. The bath is accompanied by friction to the whole body surface throughout the treatment.

Effects of the Bath.—The nerve centers are stimulated and restored; vital resistance is increased; muscle tone, the activities of the kidneys, liver and skin are all increased. The amount of oxygen received and of carbon dioxide eliminated is nearly three times the normal amount, showing a marked increase of oxidation in the body. Blood pressure is increased, the pulse is slowed, the heart is strengthened and stimulated and the number of blood corpuscles, especially the white cells, is increased.

The typhoid tub bath is usually given every three or four hours when the temperature is 102° or 103°, not because the lowering of the temperature is the primary object, but because the temperature runs parallel with and is a definite, easily determined indicator of the increased toxicity of the body. The patient dies from the effects of toxins in the body, and not from the increased temperature. In fact, the increased temperature is now believed to be a defensive reaction on the part of the body—an effort to destroy and to repel the germs which cannot live in a higher temperature.

The typhoid tub bath, therefore, aims to destroy and eliminate the toxins and prevent or relieve their poisonous effects on the body.

It is **contraindicated** in

1. Infancy, old age or inability to react.
2. Shivering, sweating, a subnormal temperature or collapse.

BRAND BATH

3. Threatened intestinal hemorrhage or perforation.
4. The presence of blood in the urine.
5. In skin diseases, pneumonia, nephritis, and other acute inflammatory conditions.

Method of Procedure.—Strict typhoid precautions must be observed throughout the treatment.

Preparation of the Patient.—The patient is covered with a sheet. The upper bedclothes are removed or fanned to the foot of the bed. The patient's gown is removed and his loins are draped. The canvas usually used for lifting and supporting the patient in the tub is then put carefully under him. The poles, used for lifting, are then inserted in the canvas. He should be disturbed as little as possible and prevented from exerting himself in any way. Non-absorbent cotton may be placed in the ears to avoid the accidental entrance of cold water, as this may cause earache, headache, dizziness and nausea. Cold applications are applied to the head and face, the temperature of the application being much lower than that of the bath.

Preparation of the Bath and Method of Giving.—Before the patient is prepared the necessary articles and utensils are brought to the bedside. The tub is filled about two-thirds with water at the required temperature, and is brought to the bedside. Two people lift the patient on the stretcher very carefully, but as quickly as possible, from the bed into the water. The sheet covering the patient is not removed until after he is in the bath. No exposure should be allowed. The patient must be immersed to the neck, care being taken not to leave the shoulders uncovered as this would allow evaporation and cause chilling and possibly pneumonia. The head is supported with a rubber pillow or air-ring. The sheet is then removed. The patient must be in a comfortable position and supported so as to avoid all strain or exertion.

During the bath friction is applied throughout the whole treatment. Friction is not applied to the abdomen. Hair on the chest, if long and plentiful, should be cut short, because the rubbing and bathing make the hair follicles red, swollen and painful. The cold applications on the head should be changed frequently and their temperature kept constantly lower than that of the bath.

The patient will shiver and complain of chilliness at first. If he continues to shiver, if his teeth chatter and his skin becomes cyanotic, stop the treatment. Remove him at once from the bath, cover him with a sheet and blanket and rub until reaction sets in. A patient is not, as a rule, removed from the bath because he complains of chilliness unless his teeth chatter. Treatments are not as a rule discontinued

BRANDY

because of chilliness, but the doctor may order whiskey or may raise the temperature or shorten the duration of the bath, or friction may be increased. The patient's pulse should be watched carefully. He should be watched closely for symptoms of chill or cyanosis, and for symptoms of hemorrhage or perforation on account of moving the patient.

The duration of the bath is usually ten minutes unless otherwise ordered.

While the patient is in the bath, his bed may be completely remade or the linen may be tightened and freshened, then covered with a large rubber.

When the bath is completed, the patient is again covered with the sheet and the loin draping is removed. Two people, as before, carefully lift the stretcher and the patient and hold it over the tub to allow the water to drain off before placing it on the bed. The cold applications are then removed from the head and the patient is dried with the sheet. As the patient is turned from side to side, the wet rubber and canvas may be removed and the back dried and rubbed with alcohol and talcum. The patient's gown, the pillows and bedclothes are replaced and the damp sheet removed.

The patient's temperature is usually taken one hour after the bath. Some doctor's prefer, however, that the patient, if sleeping, should not be disturbed for this purpose, as a natural sleep is one of the effects for which the bath is given. A nurse should find out from the doctor what his wishes are in this respect. Sleep must not be confused with a toxic condition of stupor. In this condition, taking the temperature will not disturb the patient.

BRANDY

See ALCOHOL.

BRAYERA

See CUSO.

BREAST, CARCINOMA OF

See BREAST, NEW GROWTHS OF.

BREASTS, CHANGES IN, IN PREGNANCY

The breasts begin at once to prepare for their real function of lactation. Even as early as the second or third week of pregnancy the woman may be conscious of pricking and tingling in the breasts. From the second month there is usually a sense of increased fullness, followed by a visible increase in size. The mammary tissue at the same time becomes firmer and more nodular. The nipple shares in the enlargement and becomes more erectile and darker in color, and from about the fourth or fifth month a few drops

BREAST, NEW GROWTHS OF

of thin oily fluid—colostrum—can be expressed. This fluid may dry on the surface of the nipple in the form of fine branny scales. During the third month there is a deposit of pigment in the areola around the nipple. The depth of color varies from a deep pink in blonde women to a dark brown, almost black, in brunettes. At the same time Montgomery's tubercles make their appearance. These are paler raised spots scattered over the areola, fifteen to twenty in number. They are the enlarged and pouting mouths of sebaceous glands. In the later months a faint secondary areola may be seen outside the primary areola, but it is marked only in very dark women. The veins of the breasts early become more distended and prominent, and may be seen as dark blue lines coursing over the breasts just under the skin.

BREAST, DISEASES OF

See MASTITIS, and NIPPLES.

BREAST, INFLAMMATION OF

See MASTITIS.

BREAST, NEW GROWTHS OF

As in other locations those tumors which invade breast tissue may be either benign or malignant. Of benign tumors of the breast, the most common are fibroadenomata; these occur mainly in young women; they are definitely encapsulated, freely movable, do not grow beyond a certain size, and cause no enlargement of the lymph glands of the axilla.

Treatment.—The treatment is the excision of the growth, with occasional drainage of the space left by its removal for twenty-four hours.

Carcinoma.—Carcinoma of the female mammary gland is relatively common. The rate of growth of the tumor cells will vary greatly. Any mass in the breast is strongly suspicious of carcinoma if it occurs after the age of forty, and is hard, not definitely encapsulated, and attached to the skin or deeper muscular layers. The glands in the axilla may be enlarged at a very early period. If the disease has lasted for some time the patient may be emaciated, pale, anemic and weak.

Treatment.—The treatment is radical excision of the entire breast and the lymph glands which drain it. Inasmuch as some surgeons perform a rather wide excision, the skin of the patient should be prepared from beneath the angle of the jaw to the umbilicus, from well beyond the midline of the affected side to the region beyond the axillary border of the

BREAST FEEDING

scapula (shoulder blade). This preparation, in the main, will consist of shaving the hair. Some surgeons prefer no pre-operative preparation of the skin other than that of cleansing it with green soap and water, leaving the iodine to be painted on in the operating room; others will have the skin cleansed with green soap and water, followed by alcohol, then ether, finally applying sterile dressings.

Operation.—A sandbag is placed beneath the shoulder blade of the affected side. The arm may be put out either at right angles to the body, straight, or at right angles and bent at the elbow to an angle of forty-five degrees. Inasmuch as many blood vessels are to be cut, there should be an abundance of hemostatic clamps and catgut ligatures. The surgeon will employ a drain, either the tube, or cigarette variety. After the operation, an abundance of dressing is applied, for there is apt to be a great amount of oozing. The arm, forearm, and hand, as a rule, are bound tightly to the chest.

Post-operative Treatment.—As soon as the patient recovers consciousness, she is given a backrest, so as to sit almost upright in bed. As a rule, a dressing is done at the end of twenty-four to forty-eight hours, and the drainage tube removed. At this dressing the arm is left free out of the bandage, and is held in a sling at right angles. The arm should be given passive movements carefully and gently, every two hours. The purpose of this is to diminish the adhesions during healing so that the scar will not limit the motion of the arm.

Patients are allowed up at the end of a week, and in about six weeks after operation, X-ray treatment is begun. This is used to kill some of the cancer cells which may have escaped the knife of the operator. Some surgeons at the time of operation will expose the wound to radium for a certain period of time, doing the suturing later. Occasionally the arm may be swollen a few weeks after operation, but it may be lessened by massage and bandaging, although sometimes, in spite of this, the arm remains large, interfering greatly with its movement.

BREAST FEEDING

See INFANT FEEDING.

BREECH PRESENTATION, MANAGEMENT OF

In some cases of breech presentation, particularly among primiparæ, it is necessary to assist nature in the delivery of the child in order to save its life. Complete anesthesia is usually necessary at such times and the patient is preferably on a table or at the edge of the bed in a lithotomy position.

BROMIDES

In the majority of cases, no effort is made toward assistance until the body is born as far as the umbilicus, partly because of the difficulty, before that time, of taking hold of the child securely, and partly because the perineum is not likely to be fully distended; in which case, a serious tear would probably result. But after the body has been extruded as far as the umbilicus, it is usually considered imperative to complete the delivery within eight minutes to save the child from asphyxiation, due either to pressure on the cord between the head and pelvic brim, or to premature separation of the placenta. The baby's feet or legs are grasped by a towel to prevent slipping, and downward traction is made on the body until the tips of the scapulæ appear at the outlet. During this procedure the nurse may be called upon to make pressure on the uterus with the idea of keeping the baby's head flexed forward; preventing the arms from becoming upward above the head and also to help in expelling the child.

After the scapulæ appear, the arm lying posteriorly is brought down over the chest and delivered. The body is then rotated until the other arm lies posteriorly and that is delivered. After delivery of the arms and shoulders the head is usually delivered by what is known as Mauriceau's maneuver, as follows: The accoucheur slips the index finger of one hand into the vaginal outlet and into the child's mouth, and supports the body of the child upon his hand and forearm; two fingers of the other hand are slipped around the back of the neck and curved forward like hooks over the shoulders and strong downward traction is made by these fingers; not by the one in the baby's mouth. The occiput emerges from beneath the symphysis, after which the body is lifted upward and the chin, nose, forehead and entire head are born. See LABOR, MANAGEMENT OF NORMAL.

BRIGHT'S DISEASE

See NEPHRITIS.

BRIMSTONE

See SULPHUR.

BROMETONE

Brometone is an organic bromide salt (acetone bromo-form), which is said not to cause cumulative symptoms. Dose 5 grains.

BROMIDES

The bromides are crystalline salts formed by the combination of an alkali, such as potassium, sodium, ammonium, etc., with hydrobromic acid.

BROMIDES

Potassium bromide is the most active of the bromides, and is the preparation commonly used.

Action after Absorption

Action on the nervous system: The bromides lessen the activity of the entire nervous system: the brain, the spinal cord and the nerves.

Action on the brain: The activity of the motor areas of the brain is lessened, so that they send out fewer impulses for motion. The patient then moves about slowly and languidly; he does not care to exert himself. Twitchings of the muscles and muscular contractions are lessened.

The activity of the speech area of the brain is lessened. The impulses for speech are then sent out more slowly. This makes the speech slow, hesitating, often indistinct and its tone monotonous.

The sensory areas of the brain are made less active. The patient then sees, hears, and feels objects less distinctly, and the appreciation of pain is lessened. The patient does not manifest much interest in the objects or activities about him; consciousness is lessened, and the patient becomes drowsy, or even falls asleep.

The mental activities of the brain are lessened, the memory is indistinct, and the reasoning is poor. Ideas do not arise easily. All the emotions are especially lessened; so that a nervous, hysterical, emotional individual, often becomes calm and quiet. This helps to produce sleep in such individuals, who often suffer from sleeplessness because of their nervousness.

The headache which is often produced by bromides is due to the strain that ordinary activities of the brain produce in patients under the influence of these drugs.

Action on the spinal cord: The bromides lessen the activity of the spinal cord. The reflex action of the body is therefore lessened. The patient does not then respond readily to external stimuli applied to the skin or mucous membranes. The bromides also lessen the sexual reflexes.

Action on the nerve endings: The bromides make the sensory nerve endings less sensitive.

All the foregoing effects on the nervous system are due to the bromide part of the salt, and result from any bromide salt, such as sodium, potassium, etc.

Action on the heart: The bromides make the heart beat slower and weaker, especially when it is overacting, causing a slow, weak pulse. This effect occurs principally from potassium bromide and is due largely to the potassium or basic part of the salt. The other bromides do not affect the heart as much.

BROMIDES

Action on the respiration: In ordinary doses the bromides may lessen coughing. Large doses make the breathing slow and shallow.

Effect on temperature: Owing to the lessened activity of the various organs of the body, the temperature is slightly lowered, because less heat is produced.

Poisonous Effects

Acute poisoning from the bromides does not occur. Since they are rapidly absorbed, but very slowly excreted, when administered continually for a long time the bromides may accumulate in the body and cause cumulative symptoms or "bromism."

Symptoms of "Bromism"

1. **Skin eruptions.**—These consist principally of groups of pimples on the face (acne); frequently small abscesses form in the skin. At other times, there are reddish spots scattered over the skin, and the skin may be very pale.

2. Loss of appetite, salty taste in the mouth, bad breath, and disturbed digestion.

3. Constipation.

4. Drowsiness.

5. Stupid, dull expression on the face.

6. Depressed spirits, even melancholia.

7. The eyes look heavy and dull.

8. The patient manifests no interest in his surroundings.

9. Slow, uncertain gait.

10. Slow, stammering speech, often words are forgotten and mispronounced.

11. Very poor memory, even recent events are forgotten.

12. Slow pulse.

13. Lessened reflexes (touching the conjunctiva of the eye does not cause winking, etc.).

Treatment

When the bromides are stopped, the symptoms gradually disappear. Giving cathartics and hot baths helps to eliminate the drug more easily.

Comparative Action of Bromides

Potassium bromide is the most active salt, but in large doses it may weaken the heart action and cause a slow, weak pulse.

Sodium bromide is less toxic, and is a better hypnotic.

Ammonium bromide may make the pulse and breathing faster.

Lithium bromide is apt to upset the stomach. It is said to increase the flow of urine.

BROMIDIA

Uses

The bromides are used to lessen overactivity of the brain in the following conditions:

1. To prevent epileptic convulsions.
2. To relieve the muscular twitchings of chorea ("St. Vitus' dance").
3. To relieve emotional conditions, nervousness or excitability, in neurasthenia.
4. To produce sleep when the insomnia is due to nervousness.
5. To lessen sexual excitement.

Preparations

Potassium Bromide; dose 15 to 16 grains.

Sodium Bromide; dose 15 to 60 grains.

Ammonium Bromide; dose 15 to 30 grains.

Lithium Bromide; dose 15 to 30 grains.

Strontium Bromide; dose 30 to 60 grains.

Calcium Bromide; dose 30 to 60 grains.

Dilute Hydrobromic Acid; dose 30 grains to 3 drams.

This is a 10 per cent. solution of hydrobromic acid.

Monobromated Camphor; dose 5 to 10 grains.

This preparation is used to lessen the excitement of hysteria, neurasthenia and sexual excitement. Its effect is due mainly to the camphor.

BROMIDIA

Bromidia contains potassium bromide, chloral hydrate, extract of hyoscyamus, extract of cannabis indica, licorice and oil of orange peel.

BROMINE

Bromine is a liquid element obtained from sea water. Its action is similar to that of chlorine with the following differences:

1. It is more destructive to the tissues. It is occasionally used to cauterize infected wounds (escharotic action).
2. When given internally in the form of bromides it lessens the activity of the brain. See BROMIDES.

BROMIOL OR BROMIPIN

Bromiol or Bromipin is a combination of bromine and sesame oil. It usually comes either in a 10 or 33 $\frac{1}{3}$ per cent. solution. It is claimed that it will not cause cumulative symptoms. It is given in syrup flavored with peppermint water. Dose 20 to 150 grains.

BROMISM

See BROMIDES.

BRONCHITIS

BROMOCOLL

Bromocoll contains about 20 per cent. of bromine, gelatin and tannic acid. Dose 30 to 60 grains.

BROMOFORM

Bromoform is a heavy, colorless liquid with an odor and taste like that of chloroform. Bromoform acts like chloral, but its following principal effects appear more slowly:

1. It produces sleep.
2. It relieves pain.
3. It lessens spasmodic contractions of the muscles.
4. It is an antiseptic.

It is principally used to relieve the spasmodic cough of whooping cough. Dose, 3 minims.

BROMOMANGAN

Bromomangan is a compound of iron, manganese, bromine and peptones. It contains about 11 per cent. of bromine. It is used to soothe nervousness and to build up nervous patients. Dose 1 to 4 drams.

BROMURAL

This is an organic bromide salt (monobrom-isovaleryl urea), and is used to produce sleep in nervous patients. The sleep usually lasts for three to five hours. It usually comes in tablets, each containing five grains.

BRONCHI

The two bronchi, into which the trachea divides, differ slightly; the right bronchus is shorter, wider, and more nearly horizontal, the left bronchus is longer, narrower, and more nearly vertical. They enter the right and left lung, respectively, and then break up into a great number of smaller branches which are called the bronchial tubes, or bronchioles. The two bronchi resemble the trachea in structure; but as the bronchial tubes divide and subdivide their walls become thinner, the small plates of cartilage cease, the fibrous tissue disappears, and the finer tubes are composed of only a thin layer of muscular and elastic tissue lined by mucous membrane. See TRACHEA.

BRONCHITIS

Some of the first symptoms that appear in a case of bronchitis are chill, fever, oppressed feeling in the chest, irritation in the bronchial tubes, which causes paroxysms of coughing, aching limbs and head, and a restless, nervous condition of the whole body. When these symptoms appear, a physician should be summoned, and his directions carefully carried out.

BRONCHOPNEUMONIA

One of the important things to be watched during an attack of bronchitis is the temperature of the room, which should be kept as even as possible, and never allowed to fall below 68° F. A moist atmosphere is of great assistance, and this can be accomplished by a kettle of water kept boiling in the room night and day.

Give light but nourishing food every two or three hours, such as milk, eggs, oysters, etc., and during convalescence feed the patient well. Be sure and keep the feet very warm, with hot water bags and bed socks, as cold feet will increase the tendency to cough. At the beginning of the attack a mustard foot-bath will be found most soothing and restful, and also plenty of hot drinks.

During the first few days there is generally a paroxysm of coughing in the very early hours of the morning, because during sleep mucus is apt to collect in the bronchial tubes, and cause a great deal of irritation. In order to ease the coughing, raise the head and slip two or three pillows under it, give a drink of hot milk with a dessert-spoonful of glycerin. Inhaling steam from a kettle also gives the greatest relief, and it can easily be managed by surrounding the spout of the kettle with paper, widening it out at the upper end to cover the mouth completely, then forming a tent over the patient's head with a sheet and letting him inhale the steam slowly and carefully. Mustard plasters relieve the oppression on the chest.

BRONCHOPNEUMONIA

See PNEUMONIA.

BROVALOL

Brovalol is a compound of a valeric acid salt and bromine. It is used to soothe nervous patients, and is said to be more effectual than either the valerian preparations or the bromides alone. Dose 4 to 12 grains.

BROWN MIXTURE

See OPIUM.

BRUCINE

See NUX VOMICA.

BUCHU

This is a substance obtained from the leaves of the **Barosma betulina** and **Barosma crenulata**, two South American plants. Its active principle is a stearoptene, **Diosphenol**, which is excreted in the urine and acts as an antiseptic along the genito-urinary tract. It is used in the treatment of gonorrhea.

Fluidextract of Buchu; dose 30 to 60 minims.

BURNS

BURGUNDY

See ALCOHOL.

BURNETT'S FLUID

See ZINC.

BURNS AND SCALDS

Burns and scalds are caused by the exposure of the body to a very high temperature of either dry or moist heat. **Burns** are caused by dry heat—a flame, hot air, hot solids, electricity, X-ray or radium—and by the action of corrosive poisons. **Scalds** are caused by moist heat—hot water and other fluids, steam or vapors. The effects produced on the tissues by burns and scalds are the same.

Burns may be *classified* into three degrees according to the depth of the injury:—1, simple reddening of the skin; 2, dermatitis with the formation of blisters; 3, actual charring, roasting and destruction of tissues. This may involve the superficial layer only or both superficial and true skin, or the skin, subcutaneous tissue, and muscle.

The **symptoms** are both *local* and *constitutional* and vary with the extent and location of the injury. The *local* symptoms are heat, redness, smarting, tenderness, sometimes excruciating pain, swelling, and loss of function. There may be blisters or sloughing of the tissues. In *scalds* the skin is white, thrown into rugæ and the epidermis may be detached. Scalds are usually more extensive than burns because absorption by the clothing tends to diffuse the fluid over a larger area. Superficial burns are apt to be more painful than deep burns because burns involving the upper layers of skin only will leave the ends of the nerves exposed, whereas when all the layers are destroyed the nerves are destroyed with them.

The *constitutional symptoms* vary with the age and condition of the patient, the extent and location of the injury and the amount of tissue destruction. They are more marked in burns of the chest and abdomen than of the extremities and are greater in children. Children, old people and alcoholics stand burns badly. The symptoms are the symptoms of shock, of toxemia, of meningeal irritation and congestion, inflammation or congestion of internal organs—the liver, kidneys, lungs, brain or intestines—and of acute nephritis.

Shock is present in nearly all burns. It depends more upon the extent and location than the depth of the burn. An extensive, superficial burn is much more serious than a deep burn of limited area. A burn involving an area equal to one-third of the body surface is usually fatal. Shock is more

BURNS

apt to be fatal in burns of the chest or abdomen and in children, old people and alcoholics.

Toxemia is due to the absorption of toxic products from the dead tissues. Later, during the period of suppuration, the toxemia will be caused by septic absorption. The *symptoms* are a high temperature, extreme thirst, weak, rapid pulse, low blood-pressure, vomiting and diarrhea. There may be delirium or stupor and finally convulsions or coma and death.

Treatment for Burns.—As death is most frequently due to shock, the relief of shock should be the first consideration. (See SHOCK).

Local Treatment.—This depends upon the extent and depth. When limited in extent and severity the treatment is rest and the application of cold wet dressings of normal salt solution or a saturated solution of bicarbonate of soda. Picric acid is frequently used. It is both antiseptic and astringent and promotes healing. It is not used on extensive burns because of the danger of absorption and poisoning, the symptoms of which are a yellow skin, fever, diarrhea and dark urine. When using picric acid care must be taken to protect the bed linen, etc., as it stains it yellow. Carron oil, which consists of linseed oil and lime-water, gives relief, but as it is difficult to keep the wound surgically "clean," it is considered a "dirty" dressing. Soothing ointments, such as zinc oxide, boric, cold cream or vaseline, are sometimes used. The ointments used should be sterile.

In burns of the second degree, the blisters are opened with sterile scissors at the lowest border and the fluid is allowed to escape in order to prevent infection. A wet dressing is then applied.

Burns of the third degree in which the deep skin and with it nerve endings are exposed must be protected from the air (which increases the pain) and dressed as infrequently as possible to prevent infection and allow healing to take place undisturbed. Antiseptic dressings are applied. Bandages must be put on lightly to allow for swelling. Codeine and morphine are given to relieve pain.

Clothing must be removed with the greatest care—always cut the clothing to remove. Soak the part thoroughly with peroxide of hydrogen before attempting to remove the clothing. See that the wound is quite clean and free from charred pieces of clothing. Remove the clothing very gradually, dressing each part as exposed—never at any time in applying the dressings expose a large area.

Burns of the third degree are frequently treated with ambrine or a substitute consisting of a preparation of paraffin wax, white wax and resin cerate which melt at a

BURNS

low temperature. The ambrine or its substitute is melted over a water bath, is then poured into an atomizer, from which it is applied to the burned area. The wound is first thoroughly cleansed with boric acid or salt solution. A thin layer of cotton is then applied and sealed with more wax. This excludes air, prevents infection and supplies an aseptic dressing beneath which healing can take place. When heating the wax never bring to the boiling point, as it will cause it to crumble when applied.

Burns caused by Corrosive Poisons.—The chemical substances may be acids or alkalies. Burns caused by acids should be irrigated freely with alkaline solutions to neutralize the acid. Lime-water, weak ammonia or a solution of bicarbonate of soda may be used. Carbolic acid or creosote should be neutralized by alcohol or whiskey, after which a dressing of alcohol or a soothing ointment may be applied—oil should not be used as it hastens the absorption of carbolic acid. Burns caused by alkalies (caustic soda, caustic potash or ammonia, etc.) should be treated with boric acid, vinegar and water or lemon-juice and water.

The *systemic treatment* of burns consists in the relief of shock, toxemia, congestion of internal organs, and nephritis.

Shock is relieved by rest, quiet, external warmth, stimulants, the relief of pain and immediate attention to the burned area. Pain is a powerful factor in producing shock and must receive immediate relief—morphine is usually necessary. Pain must be avoided in removing clothing and in all subsequent dressings.

Toxemia is relieved by the proper care of the wound—keeping it clean, free from infection, removing sloughing tissue or septic discharges and preventing their absorption; and by diluting the toxic products and flushing them out of the system—by forced fluids by mouth, rectum or hypodermoclysis, by keeping the bowels open with cathartics and increasing the elimination by the kidneys.

Meningeal irritation with headache, delirium and restlessness, etc., is relieved by an ice-cap applied to the head and the administration of sedatives, usually bromides.

Congestion of internal organs may be prevented by the application of cold compresses or the ice-coil. Turning the patient frequently, and steam inhalations to soothe the irritated mucous membrane of the respiratory tract will help to prevent *pneumonia*. Liquid diet and keeping the intestines free from irritating matter will help to prevent intestinal inflammation.

Acute nephritis may be prevented or relieved by lessening the work of the kidneys and aiding them in eliminating the waste and poisonous products. Their work is lessened by limiting the diet to milk and other fluids and by increasing

BURNS OF ESOPHAGUS

the elimination by the intestines, also by preventing the absorption of toxic and septic products. Eliminations are aided by forced fluids, lemonade, Imperial drink and other diuretics.

Local Complications of Burns.—The burned area may become infected with pyogenic organisms commonly found in the skin. This may result in *suppuration* and *general toxemia* from the absorption of septic products or septicemia from the invasion of the blood stream by bacteria. Infection by the streptococcus pyogenes or erysipelatis causing *erysipelas* may occur, particularly in burns about the face. Extensive sloughing of the tissues may lead to a *secondary hemorrhage*. *Embolism* may occur from the entrance of tissue cells into the blood stream. *Contraction of the tissues* in healing may occur with an unsightly scar and, if near a joint, stiffness and limited motion.

BURNS OF ESOPHAGUS

See ESOPHAGUS.

BURROW'S SOLUTION

See ALUM.

BUTYL CHLORAL HYDRATE

See CROTON CHLORAL HYDRATE.

C

CACHETS

Cachets are small disc-like pieces of rice paper which are stuck together, enclosing between them the drug to be administered.

CADE, OIL OF

This is a substance made by destructive distillation of Juniper wood. It is used as an antiseptic and irritant in skin diseases.

CAFFEINE

Caffeine is a white crystalline powder, the active alkaloid of the coffee bean, *Coffea arabica*. It is also found in tea leaves, *thea chinensis* of China; in **Paraguay tea** of Argentina and in the **kola nut** of Central Africa and the **guarana paste** of Brazil.

Coffee causes the same effects as caffeine, for the action of coffee is due principally to the caffeine which it contains.

Coffee and tea are very commonly used beverages. They are infusions of the coffee bean or of tea leaves. The coffee bean contains about $\frac{2}{3}$ per cent. of caffeine. A cup of coffee contains about one to three grains of caffeine. Coffee has a laxative effect because of volatile oils which it contains.

Tea contains about $1\frac{1}{2}$ to 2 per cent. of caffeine. A cup of tea also contains one to three grains of caffeine. Tea contains a large amount of tannic acid, which contracts mucous membranes (astringent action).

Appearance of the patient.—When a patient is given an average dose of caffeine, or when a strong cup of coffee is taken, the following effects are noticed:

The patient is more wakeful, brighter, and is able to think more quickly and better, and to reason better. In fact, all mental work can be done better and with less fatigue. The patient is more active and responds more easily, more rapidly and better, to all influences about him. The pulse is quicker and may be stronger, and the breathing

CAFFEINE

is deeper and more frequent. The patient also urinates more frequently and passes more urine.

Caffeine is an ideal stimulant, because it increases the activity of almost every organ of the body. Its effects appear in about a half to one hour after it is given, and last only for one or two hours.

Internal Action

In the mouth: Caffeine has a slightly bitter taste.

In the stomach and intestines: Caffeine produces no effects. Coffee, however, because of a number of volatile oils which it contains, increases the peristalsis, causing mild movements of the bowels.

Excretion

Caffeine is excreted mainly by the kidneys in a few hours. Very little caffeine is excreted as such. Most of it is changed to urea, a normal constituent of urine.

Poisonous Effects

Acute caffeine poisoning is very rare, because the caffeine is excreted very rapidly. The following symptoms were present in a few cases that have occurred:

1. Headache.
2. Confusion.
3. Noises in the ear.
4. Flashes of light.
5. Delirium.
6. Palpitation of the heart.
7. Rapid, weak pulse.
8. Short, quick breathing.
9. Convulsive movements of the hands and tremors of various parts of the body.
10. Profuse flow of urine.
11. Collapse (pallor, cold, moist skin, rapid, thready pulse, slow and shallow breathing, cold extremities).

Chronic Caffeine Poisoning—"Coffee Habit"

This occurs particularly in people who drink strong coffee habitually. The patient is very nervous, is easily excited and disturbed even by the slightest noise. He is unable to sleep, complains of headache, palpitation of the heart and twitching of the fingers and hands. The pulse may be rapid and irregular.

When the patient stops drinking coffee, all these symptoms disappear.

Administration

Caffeine is given in capsules, tablets or powders. It should be given well diluted in water. Since its effects appear

CALCIUM

rapidly and soon pass off, it is better to give small doses, frequently repeated, than a single large dose. When the effect of one dose wears off, there is more caffeine in the body to produce its effects.

Uses

Caffeine is one of the best stimulants for collapse. The effect is due to the stimulation of the brain, the breathing and to the contraction of the blood vessels. It is also an excellent diuretic. In heart weakness, in the course of infectious diseases, caffeine is a valuable drug, because of the general stimulation of the patient and the contraction of the usually dilated blood vessels.

Preparations

Caffeine; dose 1 to 5 grains.

Citrated Caffeine; dose 1 to 8 grains.

Effervescent Citrated Caffeine; dose one dram.

This is a mixture of citrated caffeine, sodium bicarbonate, tartaric acid and sugar, containing 4 per cent. of citrated caffeine. It effervesces when dissolved in water.

Caffeine Sodium Benzoate; dose 1 to 5 grains.

This is an excellent preparation for hypodermic use.

It is usually kept in 25 per cent. stock solutions.

CALCIUM OR CALX (LIME)

Calcium salts are found very abundantly in nature. They are found in large quantities in all the tissues of animals. Calcium phosphate is found in the bones and teeth of all animals, as well as in many of the soft tissues. Calcium salts are necessary for the activity of many forms of living matter.

Local action: The calcium salts have no effect on the skin.

Calx or unslaked lime, however, burns and destroys tissues if applied to mucous membranes.

Internal Action

In the mouth: The calcium salts contract the mucous membranes.

In the stomach: They neutralize the acid, lessen digestion and contract and soothe the mucous membranes.

In the intestines: They contract and soothe the mucous membrane (astringent action).

Action after Absorption

The calcium salts are very slowly absorbed from the stomach and intestines. Part of these salts are absorbed

CALCIUM

into the blood, however, and help to form fibrin ferment, so that the blood clots better.

In diseases where there is an insufficient amount of calcium or lime in the body, such as rickets, the bones become softened and are often deformed. The calcium absorbed from the blood is then deposited in the bones and hardens them.

Calcium is also necessary for the nutrition of nerve tissues. Many nervous conditions characterized by twitching of the muscles are believed to be due to a deficiency of calcium in the body.

Excretion

The calcium salts are excreted mostly by the large intestine and kidneys.

Poisonous Effects

Poisoning from lime occasionally occurs when unslaked lime is swallowed. The symptoms are the same as those of poisoning by other alkalies.

Slaked lime occasionally causes severe destruction of the tissues. Laborers who handle lime occasionally get some of it into the eye. When this happens the eye should immediately be thoroughly washed out with a solution of boric acid. Destruction of the eye, or loss of sight, may result.

Uses

Solutions of calcium are used locally to soothe the skin in burns. **Internally**, calcium is used to neutralize the acid in the stomach, in **hyperacidity**, to lessen nausea and vomiting, and in **ulcer of the stomach**.

When given to neutralize the acid, it is best given about a half to one hour after meals, when the stomach contains the largest amount of acid. Calcium preparations are also used as antidotes for poisoning by acids.

Calcium salts are frequently given in nervous conditions characterized by excitability, such as epilepsy, tetany, etc.

Preparations for Internal Use

Lime-Water, Solution of Calcium Hydrate (Liquor Calcis); dose 1 to 4 ounces.

This is a saturated solution of calcium hydrate or slaked lime, containing $\frac{1}{2}$ to $\frac{3}{4}$ of a grain of calcium hydrate to one ounce of water.

It is made by washing slaked lime with distilled water, and then filtering the resulting solution.

It is used to neutralize the acid in the stomach, to soothe the stomach and to lessen nausea and vomiting. It is very constipating.

CALORIES

When added to milk, it lessens curdling in the stomach and makes the milk more digestible.

Syrup of Lime, Syrup of Calcium Hydroxide (Syrupus Calcis); dose 15 to 60 minims.

This contains 5 per cent. of lime.

Calcium Chloride; dose 5 to 15 grains, well diluted.

This is used to increase the clotting of the blood. It is somewhat injurious to the tissues however. When fresh it is a good antiseptic, 6 ounces of the calcium chloride being used to a gallon of water.

Calcium Lactate; dose 3 to 10 grains.

This is used principally to increase the clotting of the blood in hemorrhage. It is frequently given for several days before tonsil and adenoid operations to prevent profuse bleeding. It is occasionally given hypodermically.

For Local Use

Lime Liniment (Linimentum Calcis), Carron Oil.—This is a mixture of equal parts of lime-water and olive or linseed oil.

Unslaked Lime, Calx.—This is made from limestone. It forms a white mass which cracks and changes to a powder, when placed in water, forming *slaked lime* and liberating heat.

It is used as a disinfectant and to destroy tissue (caustic).

For this purpose it is used together with potassium in the form of Vienna paste or potassa cum calce.

Milk and Lime, Whitewash.—This is made by adding 1 part of slaked lime to 4 parts of water. It is used as a disinfectant, especially for typhoid and cholera stools. It is also a soothing application for burns.

Chalk Mixture (Mistura Cretæ); dose half to one ounce. This contains 2.0 grams chalk suspended in 30.0 grams water by means of gums.

CALOMEL

See MERCURY.

CALORIES

The heat of the body, like that from the burning or combustion of coal in a furnace, is the result of the oxidation or combustion of food, chiefly carbohydrates and fats, but also proteins, in the body. These foods if burned in a furnace would likewise produce heat. As we only eat to live and as this production of heat in the body is so vital, the value of food to the body is reckoned in terms of calories, a calorie being the amount of heat necessary to raise one gram of water one degree Centigrade in temperature. One large calorie (C) is the quantity of heat necessary

CALX

to raise the temperature of 1000 grams of water one degree. Thus the values of the foods are as follows (Howell):

1 gram protein (heat value)	= 4100 calories (4.1 C.)
1 gram carbohydrate (starch)	= 4100 calories (4.1 C.)
1 gram fat	= 9305 calories (9.3 C.)

These figures therefore represent the amount of energy (either in the form of heat or mechanical work) these foods are capable of supplying to the body. In this way the heat or energy value of any given diet may be estimated. See Food.

CALX

See CALCIUM.

CAMPHOR

Camphor is obtained from the *Laurus camphora* or *Cinnamomum camphora*, an evergreen found in China and Japan.

Appearance of the Patient

About a half to one hour after an ordinary dose of camphor is given, the patient becomes calm and quiet, though somewhat exhilarated. He has a feeling of warmth in the stomach. The pulse may be stronger, but the rate may be slow or fast and the patient breathes faster and easier. When it is given hypodermically, these effects appear sooner.

Local action: **Applied to the skin,** camphor causes redness and a feeling of warmth. It relieves pain at the spot where it is applied, and is slightly antiseptic.

On mucous membranes: It causes slight contraction and is antiseptic.

Internal Action.—In the mouth: Camphor has a hot, bitter taste.

In the stomach: It causes a feeling of warmth, checks the formation, and hastens the expulsion of gas (carminative action).

In the intestines: It often checks diarrhea and aids in the expulsion of gas.

Action after Absorption

Camphor is absorbed from the stomach in a few hours. After absorption it affects principally the heart, the respiration, the brain and the secretions.

Action on the heart: Camphor may make the heart beat stronger. The rate may be faster or slower. Frequently camphor has no effect on the heart at all.

The blood vessels are widened, however, and the pulse may have a bounding quality and be either slow or fast.

Action on the respiration: Camphor makes the patient breathe faster and deeper. This action is not always marked.

CAMPHOR

Action on the brain: In the doses that camphor is usually given, it makes the patient feel calm and quiet, though somewhat exhilarated. This is due to increasing the controlling or inhibitory influences over the impulses usually sent out from the brain. In larger doses the action of the brain is increased. The patient then becomes more active and more talkative.

In poisonous doses, the action of the entire brain is increased, the brain sending out so many impulses, for motion, speech, etc., that convulsions and delirium may occur.

Action on secretions: Camphor slightly increases the secretions, especially the sweat and mucus.

Excretion

Part of the camphor is used up by the tissues of the body. The rest is eliminated in a few hours by the kidneys, sweat and feces.

Poisonous Effects

Overdoses of camphor produce the following symptoms, though they are rarely fatal:

1. Burning pain in the stomach.
2. Headache.
3. Dizziness.
4. Delirium.
5. Convulsions.
6. Weakness in the extremities.
7. Weak, small pulse, rapid or slow.
8. Pale, cold, moist skin.

These symptoms disappear when the drug is stopped.

Uses

Preparations of camphor such as the liniment, are used to relieve pain, in sprains or muscular rheumatism.

It is used as a heart stimulant, and often to lessen nervousness.

Recently, pneumonia has been treated by repeated intramuscular injections of $2\frac{1}{2}$ dram doses of camphor oil.

This treatment is based upon the fact that camphor checks the growth of the *Pneumococcus*, the bacterium which causes pneumonia. It is then supposed to act as a specific in pneumonia, and at the same time to strengthen the heart action.

Preparations

Camphor; dose 2 to 10 grains.

Monobromated Camphor; dose 5 to 15 grains.

CANCER

This is occasionally used to relieve nervousness, hysteria, and sexual excitement.

Camphor Water (Strength 1-125); dose 15 to 60 minims.

Spirit of Camphor (Strength 10 per cent.); dose 5 to 30 minims.

This is much stronger than the camphor water.

Camphor Oil; dose 5 to 10 minims.

This is the crude oil itself and rarely used.

Camphor Liniment or Camphorated Oil; dose 30 minims.

This is a 20 per cent. solution of camphor in cottonseed oil. It is used locally to relieve pain.

It is extensively used, however, for hypodermic use as a heart stimulant; and in doses of 10 c.c. in the treatment of pneumonia. It should always be injected deeply into the muscles.

Soap Liniment.—This contains about 5 per cent. of camphor, 6 per cent. of soap, 70 per cent. of alcohol, and oil of rosemary. It is used locally to relieve pain.

CANCER

See BREAST, STOMACH, UTERUS.

CANNABIS INDICA (INDIAN HEMP)

Cannabis indica is a resinous substance obtained from the flowers of the *Cannabis sativa* or Indian hemp, a plant growing in India, Egypt, and the southern part of the United States.

It is used as an intoxicant in various forms in most of the Eastern countries. In India, the dried plant is used for smoking, either alone or with tobacco, and is called *gunjah* or *bhanga*. *Churrhus* or *hashish* is an intoxicating drink containing the resinous juice, which is used in Arabia and Egypt. The active principle of *cannabis indica* is said to be a red oil or resin called *cannabinol*.

Appearance of the Patient

About a half to one hour after giving an average dose of a reliable preparation of *cannabis indica*, the patient feels drowsy, the sense of pain is lessened, the extremities feel numb, the patient often complains of noises in the ear, and he soon falls into a deep sleep, lasting several hours, from which he usually awakes refreshed. During the sleep, he may have particularly vivid, beautiful dreams. The pulse and breathing are normal and the pupils are dilated. Occasionally he may be somewhat exhilarated before falling asleep.

Internal Action.—When given internally it has a peculiar taste. It produces no effect in the stomach and the intestines,

CANTHARIDES

but is rapidly absorbed into the blood from the stomach, and it then acts principally on the brain.

Action on the brain: Cannabis indica lessens the appreciation of the various sensations, such as pain, touch, etc. In this way, it **relieves pain and produces sleep.**

It lessens the higher intellectual functions such as reasoning and judgment and also the sensory areas of the brain, while increasing the imagination. This accounts for the relief from pain and the characteristic vivid dreams. It dilates the pupil.

Effects of Large Doses

When cannabis indica is taken in large doses, or when it is smoked, it usually produces a characteristic state of pleasure and exhilaration which accounts for its frequent use as an intoxicant. During this state of exhilaration, ideas arise so rapidly, that time seems to pass much faster than it actually does. Events which usually last hours seem to occur in several minutes. This state of exhilaration lasts for a short time, perhaps an hour, and the patient then falls into a normal, quiet sleep from which he can be readily awakened. Often the individual has a sense of impending death.

The pulse is perhaps a little stronger and faster, the breathing is normal, and the pupils are dilated.

Uses

Cannabis indica is used to relieve pain and to produce sleep as a substitute for morphine, in neuralgia, painful menstruation, chorea, hysteria, etc. It is an unreliable drug, however, as many of its preparations are inactive. Preparations made from plants grown in warm climates are usually better.

Preparations

Extract of Cannabis Indica; dose $\frac{1}{4}$ to 1 grain.

Fluidextract of Cannabis Indica; dose 2 to 5 minims.

Tincture of Cannabis Indica; dose 15 to 30 minims.

CANTHARIDES

Cantharides or Spanish flies are dried beetles found in various temperate climates, especially in Spain and Italy. The active principle is a neutral substance, **cantharidin.**

Applied to the skin: there is produced redness and swelling with the formation of a blister. **Internally,** in small doses there is an increase in the flow of urine; sexual desire is said to be increased.

CAPILLARY BLEEDING

Poisonous Effects

Absorption of cantharides from the skin, or when taken internally in large doses, produces the following symptoms, which are due to the injury of the kidneys and alimentary tract.

1. Profuse vomiting and diarrhea.
2. Painful, scanty urination, with scanty urine, which often contains blood.
3. Delirium, convulsions and collapse.

If it is taken in solution it causes blisters in the mouth and esophagus, which often prevent swallowing.

The symptoms are best relieved by washing out the stomach, the administration of opium for the pain, and giving demulcent drinks.

Preparations

Cerate of Cantharides.

Cantharides Collodion.

Tincture of Cantharides; dose 2 to 5 minims.

Cantharides is frequently applied in the form of a plaster: a small piece of the plaster, the size of a dime, is applied over the affected area.

Before applying cantharides, the skin should be shaved, cleansed with soap and water, alcohol and ether. The plaster is then applied and left on for about 4 to 8 hours, depending upon the effect desired.

CAPILLARY BLEEDING

See HEMORRHAGE.

CAPSICUM

Capsicum, or **Cayenne Pepper**, is the extremely pungent fruit of the **Capsicum fastigiatum**, or **African pepper**.

Capsicum causes marked redness and blistering of the skin, often destruction of the area of skin over which it is applied.

In large doses it often causes violent pain in the abdomen, with vomiting, followed by profuse diarrhea and very painful urination.

Uses.—Capsicum is used to increase the secretion of the stomach, particularly in patients suffering from chronic alcoholism. In such patients the lining membrane of the stomach is so affected that it secretes very little gastric juice.

It is also used in the form of a plaster to produce blisters, in order to draw fluid from deeper tissues into the skin.

Tincture of Capsicum; dose 30 to 60 minims.

Capsicum Plaster (Emplastrum Capsici). For local use.

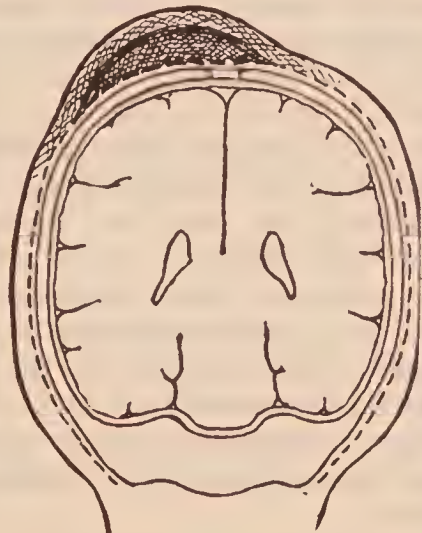
CAPUT SUCCEDANEUM

CAPSULES

Capsules are drugs made up into a small cylindrical gelatin container which disguises the taste of the contained substance.

CAPUT SUCCEDANEUM

During labor the part of the scalp which lies within the circle of the girdle of contact of the soft passages becomes the seat of a swelling. This is because it is exposed to less pressure than the surrounding areas of scalp which are pressed on by the soft passages. The swelling is a sero-sanguineous infiltration into the connective tissues of the scalp, and the position of this so-called caput succedaneum varies according to the position of the head. In occipito-anterior positions the presenting part in the early stages of labor is the vertex. Therefore the caput first forms on the vortex—on the right of the sagittal suture in L.O.A., and on the left in R.O.A. cases. As labor proceeds and flexion becomes more pronounced, the posterior fontanelle becomes



Section showing structure of caput succedaneum.

(From Johnstone's Textbook of Midwifery)

the presenting part, hence the caput succedaneum is ultimately found in that region, a little to the right or left as before. It may therefore be said that in L.O.A. cases it is on the upper posterior angle of the right parietal bone, and in R.O.A. cases on the corresponding angle of the left parietal. The appearance of the caput is generally red and congested. The longer the labor lasts, the larger does the caput tend to become, and in some cases it may so obscure the landmarks of the head as to render the diagnosis of the presentation and position a matter of some difficulty.

The caput succedaneum begins to disappear immediately after birth, and has usually quite vanished after twenty-four hours.

CARBOLIC ACID

CARBOLIC ACID (PHENOL)

Carbolic acid or phenol is a crystalline solid substance which readily absorbs moisture from the air. It is made by distilling coal tar; it dissolves readily in water, alcohol or glycerin.

Antiseptic Action

Carbolic acid destroys all living tissues (protoplasm). In weak solutions (2 to 5 per cent.) it checks the growth of all bacteria except their spores. It is the most efficient antiseptic known.

Action on the Body

Local action: Concentrated solutions destroy the skin by hardening or coagulating the proteins of the cells. This forms a white crust which becomes red and shiny. The crust falls off in a few days, leaving a light brown area. Weak solutions (2 to 5 per cent.) produce a feeling of warmth and tingling followed by numbness and contraction of the skin. Applied to wounds, carbolic acid causes pain and redness with the formation of a white pellicle of coagulated albumen.

Local applications of carbolic acid solutions, if prevented from evaporating, as when applied in the form of a wet dressing, often destroy the skin and deeper tissues (gangrene). Gangrene of a finger or other part of the body has resulted from continued use of such wet dressings. For this reason its use as a wet dressing has been given up. **On mucous membranes:** carbolic acid checks the growth of bacteria if applied in weak solutions.

Strong solutions, if applied for some time, destroy the tissues; and if the area over which it is applied is extensive, collapse may result.

Internal Action

Carbolic acid is never given internally.

Action after Absorption

When a small quantity of carbolic acid is absorbed, either from wet dressings applied to wounds or when formed in the intestine, it occasionally produces the following effects:

1. It increases the secretion of saliva.
2. It increases the flow of urine. The urine has a characteristic smoky dark green color which soon turns brown or even black.
3. Occasionally, the patient becomes somewhat drowsy, due to the lessened action of the brain.

CARBOLIC ACID

4. The breathing becomes somewhat deeper and faster and the pulse slower and weaker.

Excretion

In cases where a small quantity of carbolic acid is absorbed, it is rapidly eliminated by the urine in the form of various compounds which give the urine a characteristic dark green color.

Poisonous Effects

Acute poisoning from carbolic acid is not an infrequent occurrence as a result of attempts at suicide, since it is the easiest poison to obtain.

Symptoms.—If a large quantity of carbolic acid is taken, the patient becomes unconscious and dies within a few minutes from a sudden paralysis of the heart and respiration. This is probably due to the sudden destruction of a large area of mucous membrane and the resulting collapse.

If smaller quantities are taken, the following symptoms appear in the order of their onset. Some of these symptoms also occasionally result from the continued use of wet dressings:

1. Pain around the mouth and lips, and in the stomach. The lips and mouth are blanched.
2. Nausea and vomiting, the vomited matter containing mucus.
3. Headache, dizziness, and noises in the ears.
4. Drowsiness and depression.
5. Collapse: rapid, thready pulse, cold, moist skin, the pulse falls to 40 or 50 per minute, the breathing becomes irregular, often snoring in character. Toward the end, the breathing becomes difficult and shallow, sometimes gasping, and because of the shallow breathing the patient becomes cyanotic.
6. Finally, the patient goes into stupor, and coma, and may die from paralysis of the respiration, in about one to ten hours.

Occasionally, convulsions occur just before death. A very characteristic symptom of carbolic acid poisoning is the dark green color of the urine, and the odor of the acid on the breath. The fatal dose is usually about 1 to 4 drams.

Treatment.—1. Wash out the stomach with 20 per cent. alcohol.

2. The following salts are given as antidotes: about one ounce of one of the salts dissolved in a glass of water.

Magnesium sulphate (Epsom salts).

Sodium sulphate (Glauber's salts).

Lime-water and milk.

They form sulphocarbates, harmless salts of carbolic acid.

CARBON MONOXIDE

3. Give alcohol in the form of whiskey or brandy, or even in 20 per cent. solutions. The alcohol neutralizes the carbolic acid; its mode of action is unknown. (A carbolic acid burn is readily neutralized, if followed immediately by the application of alcohol.) The stomach should be washed out, however, as the solution is readily absorbed.

4. Protect the mucous membrane of the mouth and esophagus with albumen water, flaxseed tea or milk. Do *not* give oils or glycerin as they help to absorb the carbolic acid.

5. The collapse is treated with heart stimulants such as caffeine, strychnine, atropine, etc., and the patient should be kept warm.

Uses

Carbolic acid is used:

1. To disinfect sinks, toilets, sputum cups, clothing, etc., in 2 to 5 per cent. solutions. The articles must be soaked in carbolic acid for a half to several hours.

2. To disinfect the sick room by washing the walls and furniture. The fumes are often inhaled from such use and cause slight poisonous symptoms.

3. It is occasionally given internally to check vomiting, and as an intestinal antiseptic to check fermentation in the intestines.

Preparations

Carbolic Acid (Phenol): for internal use; dose $\frac{1}{2}$ to 3 grains.

This comes in crystals which readily take up water (hygroscopic). It is used principally for its destructive action on tissues (corrosive action).

Liquid Carbolic Acid (Phenol Liquefactum); for internal use; dose 1 to 3 minims.

This contains 90 per cent. of carbolic acid.

Glycerite of Phenol; dose 2 to 5 minims.

This contains 20 per cent. of phenol dissolved in glycerin.

Carbolic Acid Ointment (Unguentum Phenolis).

This contains 5 per cent. of carbolic acid.

As an antiseptic carbolic acid is used in 2 to 5 per cent. solutions.

CARBON MONOXIDE POISONING

This is recognized by the great difficulty with which these patients breathe, the fact that their lips are a very deep red and their skin a bluish hue. The condition requires urgent interference.

Treatment.—The blood must be rid of the excess carbon monoxide and its oxygen content increased. The patient may

CASTOR OIL

be given oxygen from a commercial oxygen tank by means of a funnel held directly over the nose and mouth. To prevent further loss of oxygen, a paper cornucopia may be fastened to the funnel. If the congestion of the patient is very extreme, blood may be removed from a vein in the arm. This reduces the actual blood content of carbon monoxide, and then the patient may be given an infusion of saline or a transfusion of blood which will still further decrease the amount of poisonous gas.

CARCINOMA OF BREAST

See BREAST, NEW GROWTHS OF.

CARDAMOMUM

Cardamom is a drug obtained from the fruit of the **Elettaria repens**, which grows in the East Indies. It is used as a carminative.

Tincture of Cardamomum (2 per cent.); dose 1 dram.

Compound Tincture of Cardamom; dose 1 to 2 drams.

CARMINATIVES

Carminatives are drugs which produce a feeling of comfort in the stomach and relieve the formation of gas in the stomach and the intestines. They also increase the appetite. The chief carminatives are capsicum, ginger, cardamom and asafetida.

CARRIERS

See INFECTIOUS DISEASES, COURSE OF.

CARRON OIL

See CALCIUM.

CASCARA

Cascara sagrada is obtained from the bark of the **California buckthorn**. Its official name is **Rhamnus purshiana**. It acts on the large intestine and is one of the best laxatives. It is usually given at night, and produces a normal stool the next morning without griping. It is often given for habitual constipation.

Preparations

Extract of Cascara Sagrada; dose 4 grains.

Fluidextract of Cascara Sagrada; dose 15 minims.

CASTOR OIL—OLEUM RICINI

Castor oil is a fixed oil (an oil which does not evaporate), obtained from the seeds of the **Ricinus communis**, a tree

CATALEPSY

growing in all warm countries. Castor oil has no odor, but a very unpleasant, nauseating taste.

Local Action: On the skin and mucous membranes, castor oil is very soothing.

Internal Action

In the mouth: It has an unpleasant, nauseating taste. Even its smell will sometimes produce nausea.

In the intestines: Castor oil produces frequent movements of the bowels in about three to six hours, not accompanied by griping. The stools are soft, but after the movements have occurred, the bowels are apt to be constipated. Because it is eliminated in the milk, castor oil often acts as a laxative on nursing infants.

Castor oil is one of the best cathartics for temporary use, because of its soothing after-effect which produces constipation.

Preparations

The dose for an adult is $\frac{1}{2}$ to 1 ounce; for an infant 1 to 2 drams.

Laxol is a tasteless preparation of castor oil.

Administration

In giving castor oil the unpleasant taste must be disguised. Castor oil should always be given cold, as the taste is then not as readily appreciated. This may be done in the following ways:

1. By giving the oil in an equal part of glycerin or brandy.
2. By making an emulsion of the oil by pouring it into flavored soda water, sarsaparilla or grape juice.
3. The patient's mouth may be rinsed out with a little whiskey or peppermint, before giving the castor oil.
4. It may be poured between two layers of lemon juice, grape juice, orange juice, or whiskey.

CATALEPSY

See SUGGESTIBILITY.

CATAPLASM

See POULTICES.

CATECHU

Catechu is an extract prepared from the wood of **Acacia catechu**, an East Indian plant. It is a powerful astringent because of the tannic acid which it contains. It is not often used.

CATHARTICS

Preparations

Tincture of Catechu; dose 30 to 60 minims.

Troches of Catechu, each contains one grain.

Compound Catechu Powder; dose 10 to 30 grains.

This contains catechu, kino, krameria, cinnamon and nutmeg. See GAMBIR.

CATHARTICS

Cathartics are drugs which are used to move the bowels

Classification

Cathartics may be divided into the following three classes, depending upon whether they cause **mild action**, **moderate action**, or **more violent action**:

1. **Laxatives or Aperients**
2. **Purgatives** (Simple and Saline)
3. **Drastic Purgatives**

1. **Laxatives or aperients** are medicines which cause a few movements of the bowels. The stools are formed, normal in character, and the movements are not accompanied by griping.

2. **Purgatives** are drugs which produce frequent movements of the bowels, with soft stools accompanied by griping. There are two kinds of purgatives: **Simple and Saline**.

1. **Simple purgatives** are plant or other substances which cause frequent movements of the bowels.

2. **Saline purgatives** are inorganic (mineral) salts used as purgatives. These are often called **hydragogue cathartics** because they produce very frequent watery stools.

Many purgatives are also called **cholagogue cathartics** because the stools resulting from their use are highly colored with bile.

3. **Drastic cathartics** are drugs which cause frequent fluid movements of the bowels, accompanied by severe griping pains. Drastic cathartics should not be given to very young or to very old patients. In pregnant women they may induce abortion. Drastics may cause nausea, vomiting, abdominal pain and profuse diarrhea. As a result of these symptoms, there is usually severe collapse: the skin is pale, moist and cold, the breathing is slow and shallow, the pulse is rapid, thready and weak, the pupils are widely dilated, and the patient finally goes into coma and may die.

Administration

Cathartics which produce mild effects, or which produce their effects slowly, should be given at night. Those which produce rapid effects should be given in the morning.

Summary of Principal Cathartics

1. Cathartics Arranged According to Site and Rapidity of Action

Group	Acting on Duodenum	Ra- pidity of Action	Acting on Small Intestine	Ra- pidity of Action	Acting on Large Intestine	Ra- pidity of Action	Acting on Entire Intestine	Ra- pidity of Action
Laxatives		<i>Hrs.</i> 8-12	Olive Oil	<i>Hrs.</i> 8-12	Cascara Agar Agar	<i>Hrs.</i> 8-12 8-12	Mineral Oil	<i>Hrs.</i> 8-12
Purgatives	Calomel Mercury preparations Podophyllum	2-8 2-8 8-12	Castor Oil	2-8	Rhubarb Aloes Senna Phenolphthalein A. B. and S. Pill (Lapactic pill)	8-12 8-12 8-12 8-12 8-12	Licorice Powder Physostigmine Saline Cathartics (when dilute) (when concentrated)	8-12 $\frac{1}{2}$ -4 1-2 6-12
Drastic Cathartics			Jalap Elaterine Colocynth Gamboge Scammony Compound Cathartic Pill	2-4 $\frac{1}{2}$ -3 2-4 2-4 2-4			Croton Oil	$\frac{1}{2}$ -2

Note: The cathartics that act slowly are best given at night.

2 Cathartics Arranged According to Time of Administration

Group	At night	Before breakfast	Between meals	Special Methods of Administration
Laxatives	Cascara Sulphur Agar Agar		Olive Oil	Mineral oil, Liquid Prolatum (2 hrs. after meals)
Purgatives	Podophyllum Phenolphthalein Compound Licorice Powder	Saline Purgatives	Calomel Mercury preparations Castor Oil Rhubarb Aloes Senna A. B. and S. pill (Lapatic pill)	Phystigmine (hypodermically)
Drastic Cathartics			Croton oil Jalap Elaterine Colocynth Gamboge Scammony Compound Cathartic pill	Elaterine (hypodermically)

CATHARTIC PILLS

Cathartics should never be given after meals as they may cause vomiting.

Cathartics which cause violent action should not be given in cases where the intestine is diseased (for example—in typhoid fever or acute appendicitis).

In cases that have had an abdominal operation performed upon them, the nurse should never administer a cathartic without the doctor's order.

CATHARTIC PILLS

Compound Cathartic Pills

(Pilulæ Catharticæ Compositæ)

This is very frequently used. Each pill consists of:

Compound Extract of Colocynth	1½ grains
Calomel	1 grain
Resin of Jalap	⅓ of a grain
Gamboge	¼ of a grain

1 pill is given for a purgative, 3 pills for a drastic effect.

Vegetable Cathartic Pills

(Pilulæ Catharticæ Vegetabiles)

Compound Extract of Colocynth	1 grain
Extract of Hyoscyamus	½ grain
Resin of Jalap	⅓ of a grain
Extract of Leptandra	¼ of a grain
Resin of Podophyllum	¼ of a grain

and about one minim of oil of peppermint for every hundred pills.

The peppermint and the hyoscyamus lessen the griping.

CATHETERIZATION

Conditions in which Catheterization is Resorted to.—

1. *Retention of urine.*—This may be due to a temporary paralysis following an anesthesia, to dulled senses following the use of drugs such as alcohol and morphine, etc., to paralysis, to shock, to operations on the pelvic organs or on the rectum or anus which are supplied by the same nerves, to loss of tone in the muscles of the bladder or to a nervous contraction of the urethra.

2. *Retention with overflow.*—In this condition there is voluntary or involuntary micturition, in small, frequent amounts, which does not relieve the bladder. The bladder is distended and can easily be seen or felt and the patient is in constant distress, obtaining no relief from voiding.

3. *Involuntary micturition.*—This may occur when the

CATHETERIZATION

patient is in a stupor or coma or may result from injuries to the spine or after an operation such as a prostatectomy.

4. *Catheterization as an aid to diagnosis.*

5. *Catheterization to prevent infection of a wound.*—It is a rule, with some surgeons, to have a patient catheterized every eight to twelve hours following an operation on the perineum or external genitals, etc., to keep the stitches dry and the wound free from infection until it is healed sufficiently to be no longer in danger. Other surgeons feel that, if the parts are kept clean, particularly after the use of the bedpan, the urine will do little harm, whereas frequent catheterization may do considerable harm.

Dangers Involved in Catheterization.—Even when this treatment is given with the greatest care, aseptic precautions, and skill, there is considerable risk of the patient developing cystitis as a result. This is particularly true when the treatment must be repeated over a period of days or weeks, or when the patient's general weakened condition predisposes to infection.

Before catheterizing a patient, or even reporting that she is unable to void, every nursing measure should be tried to cause the bladder to empty itself in a normal way.

The Procedure.—The *principles* to be observed in catheterization are:

1. The prevention of infection by thorough cleansing of the part, by surrounding the part with sterile towels, using sterile instruments and utensils, and allowing nothing unsterile to come in contact with the meatus.
2. The avoidance of injury by using the proper catheters and the proper method of inserting them.
3. The protection of the patient from exposure and chilling, etc.

The *articles* necessary for catheterizing a female patient are two or three sterile catheters and sterile sponges boiled for five minutes (and brought to the bedside in the receptacle in which boiled), sterile towels for draping, sterile basin for receiving the urine, a basin for the discarded sponges and catheter, a basin of hot boric solution for cleansing the parts; the water in which the catheters, etc., are boiled may be poured off and boric acid added.

The *catheters* used may be made of glass, soft rubber or silver.

Glass catheters are about six inches long, with a bent, rounded tip and holes in the side. The advantage of glass is that it is easily kept clean and sterilized. The disadvantage of glass is that it is easily broken or cracked in boiling and may break when in the bladder. They are used only for women.

CATHETERIZATION

A rubber catheter must always be used (1) for all restless, nervous, delirious or irrational patients; (2) for children and irresponsible patients; (3) for pregnant women; (4) for conditions in which there is a stricture or obstruction in the urethra to the passage of the catheter; (5) following operations on the vagina or perineum; (6) when the vagina is tightly packed making the passage of the catheter difficult and breakage liable if glass were used.

When a rubber catheter is used some authorities consider it necessary to lubricate it with a sterile lubricant, while others consider this unnecessary and that it is safer to use the catheter lubricated only by the solution in which it stands.

Preparation of the Patient.—If the patient is conscious and rational explain the necessity for the treatment and the need for her coöperation. Try to relieve any nervous dread of exposure or discomfort. She should be thoroughly relaxed and remain perfectly still. One of the most essential things in the treatment is a good light. While very little exposure is necessary, the nurse should see exactly what she is doing and be free to give her entire attention to the treatment.

The position of the patient is important. She should lie on her back near the right side of the bed, with her thighs and knees flexed and limbs well separated and relaxed. A blanket should be placed across the chest, as it is most important that the patient should not become chilled.. After the patient's gown, the upper bedclothes, the sterile draping and the utensils (which must be in a convenient position) are arranged satisfactorily and everything is in readiness to begin the treatment, the nurse "scrubs up," after which she must touch nothing unsterile (at least with her right hand). Before leaving the patient to "scrub up" a sterile pad or folded towel may be placed over the vulva to avoid exposure.

Method of Procedure.—The nurse should stand on the patient's right and before touching the catheter she should, with thumb and index finger of her left hand, separate the labia gently but sufficiently to clearly expose the meatus. Then with moistened sterile sponges (in her right hand) she should thoroughly cleanse the parts, wiping gently but firmly from above downward, using each sponge only once and handling it so that her fingers touch nothing but the sterile surface of the sponge. Then, without removing the fingers of her left hand from the labia, with her right the nurse introduces the catheter directly into the urethral meatus without allowing it to touch anything else. The nurse also, though her hands are "clean," never touches the end of the catheter to be inserted.

Before inserting a glass catheter always examine it care-

CATHETERIZATION

fully for cracks. When inserting a glass (or silver) catheter introduce it with the curved tip pointing upward and direct it upward and backward so as to follow the curve of the urethra. The soft rubber catheter easily follows the curve of the urethra.

Never use force when inserting the catheter, but insert it gently. The muscular walls of the urethra may be contracted, due to nervousness, which will pass away, or the patient may voluntarily contract the muscles if she objects to the treatment. Ask her to take a deep breath and to breathe deeply.

When the urine stops flowing, withdraw the catheter slightly so that the end in the bladder will remain in the urine as it reaches a lower level, and wait a moment to see if more urine will flow. If no more comes, then withdraw the catheter (placing a finger over the open end), hold it over the basin, and, as the finger is removed, the pressure of the air will force the urine out. Place the catheter in the separate basin with the discarded sponges, etc. Before removing the fingers from the labia, cleanse and dry the parts as before.

The patient should experience no discomfort during, and usually feels great relief following the treatment.

Catheterization of a Male Patient

Male patients are catheterized by the doctor. Pupil nurses are not taught to pass the catheter on a male patient and graduate nurses are only required to do so in most exceptional cases. Nurses are, however, responsible for preparing the articles necessary for this procedure.

The *articles* required will be a sterile sheet, sterile lubricant for the catheters, sterile gauze wipes or sponges for cleansing, a basin containing boric acid solution, 2 per cent., a pair of sterile dressing forceps, a sterile receptacle containing several sterile catheters of different sizes, the most commonly called for being number ten, fourteen and eighteen, French soft rubber catheters. A receptacle for the discarded wipes and catheters will also be required.

Rubber catheters are sterilized by boiling for three minutes. Too long boiling softens and roughens the catheters so that they become unfit for use.

Method of Procedure.—If, in an emergency, a nurse is required to catheterize a male patient, she should take the same precautions to prevent infection and exposure as when catheterizing a female patient. The patient may be suitably draped and the treatment performed with very little exposure. The catheter is lubricated with a sterile lubricant. Before inserting the catheter the penis is cleansed; the foreskin

CATHETERS

is gently pushed back and the glans and meatus are cleansed with the boric acid solution in order to remove any secretions which may be present. The penis is held at an angle of about 60 degrees and the catheter is gently inserted. Frequently some resistance to the passage of the tube is met with, due to the contraction of muscles. When this occurs wait a moment and the catheter can then be gently inserted further. Force must never be used in passing a catheter as great and permanent harm may be done in this way. If the resistance is due to the nervous contraction of the muscles it will soon pass away; if not, further attempts to pass the catheter will only do harm. After the urine is removed from the bladder the parts are cleansed and dried as before.

See URINE, RETENTION OF.

CATHETERS, CARE OF

Glass catheters are used for women only. After use, they are washed with green soap and tepid water, rinsed in clear water, and boiled for ten minutes. When not in use, they may be stored in a 1 to 40 carbolic acid solution.

Soft Rubber Catheters.—After use they are cleansed with green soap and tepid water, irrigating from the eye downward. They are boiled for ten minutes to sterilize. If to be kept sterile when not in use they are drained and dried in a sterile towel and put away in a dry sterile towel. These catheters are then considered clean, not sterile, and are resterilized by boiling before use.

Gum Elastic Catheters.—These may be cleansed in the same way as rubber catheters and sterilized by boiling. These catheters become very soft and are very easily injured and ruined when hot. If not properly treated they roughen, bend, and lose their shape so that they are unfit for use. Roughened catheters, whether of glass, rubber or gum elastic, etc., should never be used. They irritate the delicate mucous membrane of the urethra and predispose to infection. To boil gum elastic catheters they should be rolled in gauze so that they do not touch each other. The vessel in which they are boiled must be longer than the catheters so that they do not become bent. The water must be boiling and the catheters should not remain in the water longer than necessary. They should be lifted from the water in the gauze in which they are wrapped. The catheters themselves must not be touched until they are cold.

CAUSTIC POTASH

See ALKALIES.

CERATES

See ALKALIES.

CAUSTIC SODA

CAUSTICS

See ESCHAROTICS.

CAUTERY

See THERMO-CAUTERY.

CAYENNE PEPPER

See CAPSICUM.

CELLULITIS

When an infection invades and infiltrates the surrounding tissue the condition is called cellulitis. The organisms which produce cellulitis are more commonly the streptococci, the staphylococcus aureus or albus and the colon bacillus. Where the tissues are loose the infection spreads very rapidly. Cellulitis may result from the spreading of infection already present in a post-operative wound or from the invasion of the wound by bacteria. When not associated with a post-operative wound it may be due to infection following an injury to the tissues resulting from friction, heat or cold, counter-irritants, injections of irritating drugs, and snake or insect bites. Even a pin prick, if it introduces the germs, may be followed by a serious and even fatal cellulitis. When it occurs in patients where the circulation is poor, as in marked arteriosclerosis, or when the metabolism of the tissues is interfered with and the blood is abnormal, as in diabetes, or when the nutrition of the tissue is poor, as in spinal cord lesions, cellulitis may be rapidly fatal. Sometimes a patient's resistance is poor to special kinds of infection.

The **symptoms** are both local and general. The local symptoms are those of an acute inflammatory process—heat, redness, swelling, intense throbbing pain, and loss of function. The general symptoms are due to absorption of toxins or septic material and are the general symptoms which accompany fever or sepsis. The local symptoms often resemble the early symptoms of erysipelas so that it is difficult to make a diagnosis until the demarcation in erysipelas is well established. Cellulitis may be mistaken for erysipelas or vice versa. Both spread very rapidly.

The **treatment** usually consists in the application of moist dressings or a continuous bath, where possible, and surgical interference by incision and drainage.

CERATES

Cerates are preparations of drugs made up with white wax.

CEREA FLEXIBILITAS

CEREA FLEXIBILITAS

See SUGGESTIBILITY.

CEREBROSPINAL FLUID

Normal spinal fluid is alkaline in reaction and has a specific gravity of from 1.005 to 1.010. The solids contained in it consist of a trace of protein, 0.05 per cent., white blood cells, 1 to 10 per c.m., and a small amount of sugar. Its pressure is sufficient to support 60 to 100 mm. of water, or to cause the fluid to flow through the needle at the rate of one or two drops per second. When the fluid flows more slowly it may be because the needle is not properly inserted, or because the exudate is too thick or purulent, or because the intercommunication between the sub-arachnoid spaces of the brain and cord is shut off.

In inflammation of the meninges, an examination of the cerebrospinal fluid may show an increase in pressure, in specific gravity (due to increased solids), in the amount of protein, and in the number of white cells or leucocytes. It may also show an absence of sugar, and may show the specific organism causing the infection.

In meningitis, the intraspinal pressure may be very high (200 to 800 mm. of water), causing the fluid to flow more freely or even to come out in spurts. The white cell count may also be very high, often reaching several hundred per c.m. In syphilis the white cell count may be from 20 to 200 or more.

In tuberculous meningitis the fluid is usually clear. The differential leucocyte count shows an increase in lymphocytes: There may be 100 per cent. lymphocytes.

In acute meningitis, due to the meningococcus, the pneumococcus or streptococcus, the fluid may be cloudy, turbid, yellowish or greenish. The differential leucocyte count shows an increase in the polymorphonuclear white cells.

CEREBROSPINAL MENINGITIS

Cerebrospinal meningitis contrasts with poliomyelitis, while also in some clinical points resembling it. Its incubation period and its prodromal period are supposed to be about the same respectively in length as those of poliomyelitis; the fastigium varies immensely in different cases, but is usually a matter of weeks.

Poliomyelitis affects chiefly certain portions of the interior of the nervous system, cerebrospinal meningitis rather the exterior, and the coverings, of the cord and brain. Poliomyelitis produces typically paralysis. Cerebrospinal rather tends to excessive stimulation of the nerves leading

CEREBROSPINAL MENINGITIS

to the muscles, hence to spasms, convulsions, etc., although later paralysis may develop. Poliomyelitis is chiefly in evidence in children, cerebrospinal meningitis much more largely occurs in adults. Both are supposed to have approximately the same incubation period, and somewhat the same prodromal period; but cerebrospinal meningitis, when recognized as such, is usually ushered in by headaches, stiff or retracted neck, and vomiting. The typical symptom of cerebrospinal meningitis is not paralysis but spasm, often of the eye muscles.

Inability to straighten the knee, if the thigh be put first at right angles to the body (Kernig's sign), is commonly present.

A crucial distinction is obtained by lumbar puncture, the fluid of poliomyelitis being clear, that of cerebrospinal meningitis cloudy—the latter usually also containing the causal germ, the meningococcus, which can readily be found under the microscope and grown in culture.

Cerebrospinal meningitis and poliomyelitis resemble each other in that the infectious period and mode of infection are still in doubt. Active cases in both diseases, although looked upon with great fear, seem seldom to produce new cases clearly traceable to them. The infective agent is supposed to be passed on from person to person until a susceptible one is found.

The **treatment** of cerebrospinal meningitis which has proved most successful consists in (a) repeated lumbar punctures, allowing the escape of the accumulated fluid and thus relieving pressure, (b) the use of Flexner's serum to replace the withdrawn fluid, *to the extent only of one-third of the amount withdrawn* (in order to avoid restoring the pressure just relieved by the withdrawal), (c) the use of vaccines, autogenous preferably.

See POLIOMYELITIS, ACUTE ANTERIOR.

CEREBROSPINAL MENINGITIS

Summary of Treatment

Distribution of the Family

The disease is contagious and isolation should be obligatory.

The children of the family and other "contacts" should be kept from other children, as possible carriers.

The children of the family should be isolated over a period that probably covers the illy defined incubation period, i.e., three to four weeks.

The nasal passages of the suspects should be examined for diplococci.

CEREBROSPINAL MENINGITIS

Adults, too, should be kept from the sick-room unless their duty keeps them there.

Adults of the family should not come in contact with other children and if their duty brings them in contact with children, they should remove from the environment of the patient and submit to the isolation period before seeing children again.

"Contacts" should have their nasal secretions examined. If they are positive, they should keep from children during the epidemic and, if possible, isolate themselves until the cultures are negative.

Avoid infections of nasal passages, especially during epidemics of colds and sore throats.

"Contacts" should use a mild spray for the throat and nose, 2 per cent. boric acid solution or quarter strength Dobell's solution.

Never use strong astringents.

Nurse

Some cases require a night and a day nurse.

Very likely to become a "carrier."

Avoid contact with children.

Remember the ease of conveyance by kissing, coughing and sneezing.

Before going out clean hands and face with soap and water followed by alcohol or 1:1,000 bichloride and

Spray throat and nose with the mild solutions mentioned.

Should spray throat and nose from time to time while on duty.

Room

Choose with reference to light and air.

Veranda or porch approach.

Bathroom near by.

Should be stripped of furnishings.

Carpet lining or unbleached muslin on the floor.

Screens for the eyes, if sensitive to the light.

Avoid jars, noise and other sources of irritation.

Precautions in the Sick-room

Nasal and oral secretions should be received on rags and burned or disinfected in 1:20 phenol or 1:500 bichloride.

Thermometer.

Should be left in sick-room and kept in 2 per cent. phenol or in formalin.

Eating utensils.

Boil in sick-room, or if sent out of sick-room soak in phenol 1:20 for twenty minutes to half-hour, then send out to be boiled.

CEREBROSPINAL MENINGITIS

Clothes.

Soak overnight in 1:20 or 1:50 phenol, then boil half-hour before sending to the family wash or laundry.

Urinals, bed-pans, etc.

1 : 20 carbolic or 1 : 500 bichloride.

Patient

Isolation.

Nightgown should be of light flannel or, if irritating, cotton.

Should be open all the way down the front to facilitate examinations.

Diet

Early days do not force.

Later consider the body needs.

In infancy modified milk is to be further diluted.

In stupor or dysphagia.

Nasal or oral gavage.

Nasal better in children; oral in infancy.

Drinks should be forced.

Water, alkaline waters, fruit juice, as lemonade, etc.

Care of Body

Skin.

Cleansing bath of soap and water daily.

Bed-sores.

Prevention. Change of position.

Scrupulous dryness; use of rings and cushions.

Rubbing of skin with hands.

Use of alcohol and talcum powder.

Care of bed in avoidance of wrinkles and crumbs of food.

When sores threaten, use air mattresses or water-beds.

Sores should be handled on surgical principles.

Mouth and nose.

Remember that the secretions are infectious.

Rinse mouth with plain water, then with

Boric acid solution 2 per cent. to 4 per cent. or with

Dobell's solution quarter to half strength.

Teeth.

Brushed with soft brush or cotton swabs, wet with above solutions, care being taken to free interstices from particles of food.

Remove particles between gums and cheeks.

Sordes and coated tongue.

Soften with half strength official peroxide of hydrogen, then scrape tongue with edge of whalebone.

Follow with the boric acid or Dobell's solution.

CERIUM OXALATE

Dry mouth and tongue.

Use 2 per cent. boric acid solution, with equal amount of albolene. Flavor with lemon-juice.

Nose.

Soften hard secretions with olive oil.

Spray with boric acid or Dobell's solution.

Burn all secretions as infectious.

Nurse should carefully wash hands and use alcohol or 1:1,000 bichloride as an antiseptic after these ministrations.

Eyes.

Mild conjunctivitis is common.

Secretions are probably infectious and should be burned.

Cleanse eyes with 2 per cent. boric acid solution.

Care of bowels

Open freely at the beginning.

Throughout the illness use,

Milk of magnesia 2 to 4 drams, or

Liquor magnesiæ citratis 4 to 8 ounces.

Hunyadi or similar water.

Enemata, especially if there is vomiting, though hyperesthesia may make it a too distressing procedure.

Nausea

A feature of the onset is vomiting, and it may continue for some time.

One may try:

Cracked ice.

Mustard paste, 1 in 3, 4, 5, or 6 of flour to pit of stomach.

Lavage.

Bladder

Watch for distention.

Apply hot stupes over the epigastrium.

Catheterize.

Urotropin.

Doubtful value.

Dose: 5 grains, two to four times a day well diluted.

CERIUM OXALATE

It is used to check vomiting; in pregnancy, sea-sickness, and in other conditions. Its mode of action is unknown. Dose: 2 to 10 grains.

CERUMEN, IMPACTED

See EAR NURSING.

CERVIX

See UTERUS.

CHEYNE-STOKES RESPIRATIONS

CHALK MIXTURE

See CALCIUM.

CHAMPAGNE

See ALCOHOL.

CHANCRE

See VENEREAL DISEASES.

CHANCROID

See VENEREAL DISEASES.

CHANGE OF LIFE

See MENOPAUSE.

CHARCOAL (CARBO LIGNI)

Charcoal is made from wood or bones. It readily absorbs gases and is therefore used to remove gas from the intestines.

It is best given in capsules, since it soon loses its efficiency when dissolved in a fluid.

CHENOPODIUM (AMERICAN WORM SEED)

This is the fruit of the *Chenopodium ambrosioides*, or Jerusalem oak. Its active principle is a volatile oil, which has an extremely unpleasant odor. It is used principally to destroy round worms, and should always be followed by a brisk cathartic.

Preparation

Oil of Chenopodium; dose 3 to 5 minims.

It is usually given on sugar or in an emulsion.
And see ANTHELMINTICS.

CHEST, ASPIRATION OF

See THORACIC ASPIRATION.

CHEYNE-STOKES RESPIRATIONS

This is a type of respirations which appears in two forms: (1) The respirations increase in force and frequency up to a certain point, and then gradually decrease until they cease altogether, and there is a short period of apnea, then the respirations recommence and the cycle is repeated. (2) The respirations increase in force and frequency up to a certain point, then cease, and the period of apnea intervenes, without the gradual cessation of the respirations. This condition is associated with disease of the kidney, brain, or heart. The cause is not settled, but it is of bad prognosis and often indicates a fatal termination.

CHICKENPOX

CHICKENPOX (VARICELLA)

Chickenpox.—A communicable disease—cause unknown—occurring chiefly among children, characterized by a slight fever, and an eruption which appears suddenly, first as small red spots, rapidly becoming vesicular, then pustular, about the size of a pea. These dry and form a crust.

The incubation period is from two to three weeks. The lesions may appear on any part of the body, on both skin and mucous membranes. There may be few or they may cover the entire body. They appear in successive crops; the duration of each lesion is about seven days from beginning through crusted stage. Contagion ceases when the skin is free from crust. No scar is left unless the lesion has been infected.

There is little to be feared from complications. The patient is usually mildly ill and soon recovers.

Treatment: Isolation. Rest in bed in a well ventilated room. Daily warm, cleansing baths followed by anointing the body with some antiseptic oil or ointment to prevent the lesions from becoming infected.

Bed and body linen should be changed daily, thereby preventing re-infection. Finger nails should be kept short. The patient should have an abundance of water to drink and plenty of easily digested food. The remaining care is the same as that given to any bed patient.

See INFECTIOUS DISEASES, COURSE OF.

CHILBLAINS

See FROST-BITES.

CHIMAPHILA (PIPSISSEWA)

Chimaphila is obtained from the leaves of **Chimaphila umbellata**, an American plant. Its active principles are the glucosides, **arbutin** and **chimaphilin**. It also contains some tannic and gallic acids.

Chimaphila produces the same effects as *uva ursi*. It contracts the mucous membranes and increases the flow of urine.

Preparation

Fluidextract of Chimaphila; dose 30 to 60 minims.

CHINOSOL

Chinosol or **oxyquinoline sulphate** is an artificial chemical substance which comes in the form of a yellow powder. It is used as an antiseptic for the skin, as a nasal spray, as a gargle and as a douche in 1:5,000 to 1:1,000 solutions.

CHLORAL HYDRATE

CHLORAL CAMPHOR

Chloral Camphor consists of equal parts of chloral and camphor and is used as a local application to relieve pain.

CHLORALFORMAMID

Chloralformamid is a white, crystalline powder with a slightly bitter taste. It is a chemical compound of chloral.

It produces sleep; its effects are similar to those of chloral. It does not weaken the heart action, but it is not as reliable as chloral. It is usually given in powder form, dissolved in whiskey. Dose 15 to 30 grains.

CHLORAL HYDRATE

Chloral is an oily, colorless liquid made by the combination of chlorine gas with absolute alcohol. It is not used in medicine, but when it is combined with water it forms crystals of **chloral hydrate**, which is the preparation ordinarily used.

About 5 to 15 minutes after an average dose of chloral hydrate is given, the patient feels tired and drowsy, and soon falls asleep. The sleep lasts for about five to eight hours. It resembles the natural sleep, and the patient can be easily awakened. During the sleep, the pulse and breathing are slow, and the pupils are contracted. When the patient awakes, he may complain of a little headache and dizziness, and may be somewhat confused.

Applied to the skin chloral causes redness and even blisters. It also acts as an antiseptic, checking the growth of bacteria. It occasionally causes nausea and vomiting. After absorption, chloral lessens the activity of the brain, and the reflex actions of the spinal cord; it makes the heart beat and the pulse slower and weaker; the breathing becomes slower and shallower, and the body temperature is lowered.

Idiosyncrasies.—Chloral often causes the following unusual effects:

1. Redness and swelling of the conjunctiva.
2. Flushed face and neck.
3. Eruptions on the skin, which often desquamate.
4. Dyspnea.
5. Rise of temperature.

Dangerous Symptoms.—In giving chloral, the patient must be carefully watched, and the pulse should be taken very frequently, as sudden heart failure from chloral is not at all uncommon, even from a single dose. Dangerous symptoms are:

1. Restlessness.
2. Slow, weak pulse.

CHLORAL HYDRATE

3. Slow, shallow breathing.
4. Coma.

The chloral should be stopped when these symptoms appear. The danger is usually over when the pulse is above 60 and is regular and strong.

Tolerance.—If chloral is taken habitually, the patient becomes accustomed to the drug, so that large doses may be taken without producing any poisonous effects.

Poisonous Effects

Acute chloral poisoning is a condition which may result when an overdose of chloral is given medicinally, or from the malicious administration of an overdose of chloral in alcohol ("knockout drops").

Symptoms.—1. Very deep sleep from which the patient is aroused with difficulty.

2. Very slow and shallow breathing.
3. Slow, weak, irregular pulse with low blood pressure.
4. Insensibility to pain.
5. Contracted pupils.
6. Relaxation of the muscles.
7. Coma.
8. Collapse.

Death usually results from paralysis of the heart and breathing. The smallest fatal dose is 30 grains.

Treatment.—1. Wash out the stomach.

2. Give artificial respiration.
3. Keep the patient warm and quiet. Excitement may be fatal.
4. Atropine, caffeine, strong coffee, or alcohol are usually given to increase the action of the heart and respiration.

Chloral Habit

Habitual use of chloral often causes symptoms resembling those of chronic alcoholism:

1. The patient feels melancholic and "blue."
2. Wakefulness and nervousness at night.
3. Loss of appetite and disturbed digestion.
4. Various eruptions on the body.

If the drug is suddenly stopped, symptoms resembling delirium tremens result. To relieve these symptoms, the patient must be gradually weaned of the habit.

Uses

1. To produce sleep.
2. To lessen the excitement of delirium tremens and other similar conditions.
3. To prevent the convulsions of strychnine poisoning, epilepsy, uremia, etc.

CHLORETONE

Administration

Chloral hydrate is best given only slightly diluted in syrup, about 15 minutes to a half hour before bedtime. The dose is 10 to 30 grains.

CHLORALOSE

Chloralose is a white, crystalline powder, having a bitter taste. It is a compound of chloral and glucose. It produces sleep; its effects are similar to those of chloral, but it is not as reliable. Dose 5 to 10 grains.

CHLORAMINE

Chloramine T (Chlorazene).—This is a sodium compound of a complex organic chlorine preparation. It is four times as strong as phenol. It acts like Dakin's solution; it is more stable, lasts longer but it has not the dissolving power of Dakin's solution. It is used in 1 or 2 per cent. solutions applied in the same manner as Dakin's solution. It is also used as a mouth wash and as an irrigation for the urethra, bladder and uterus.

Chloramine B.—This is a sodium preparation of a complex preparation (Sodium benzenesulphochloramene). It is used in the same manner and it has the same effects as chloramine T.

See DAKIN'S SOLUTION.

CHLORAZENE

See CHLORAMINE.

CHLORCOSANE

This is a thick liquid consisting of liquid paraffin containing chlorine in a stable, non-active combination. This substance is used merely as a solvent for dichloramine T so as to prevent the chlorine combining with the oil (which is already combined with chlorine), which would otherwise prevent its action. It is used as a spray.

See DAKIN'S SOLUTION.

CHLORETONE

Chloretone is a white, crystalline powder which does not readily dissolve in water. It has an odor like camphor. Applied to the skin it acts as an antiseptic. When it is taken internally, it is rapidly absorbed into the blood, and acts principally on the brain, producing sleep. Chloretone is used to produce sleep, very frequently to check an epileptic attack; and to lessen other convulsions, such as those occurring in tetanus, etc. It is occasionally used to check vomiting and sea-sickness. Dose 5 to 15 grains. It is also used in a 1 per cent. solution.

CHLORINE

CHLORINE

Chlorine is an element which occurs in the form of a greenish yellow gas. It is obtained from sea salt, and a number of its compounds are used as disinfectants.

Antiseptic action: Chlorine gas is one of the most efficient disinfectants known; especially when it is used in the presence of moisture. The chlorine combines with the hydrogen of the water, thus setting oxygen free. The oxygen then destroys the bacteria. A 0.3 per cent. solution of chlorine will destroy even the spores of bacteria in about three hours. Chlorine also removes obnoxious odors very readily (deodorant).

Local action: Concentrated solutions of chlorine gas redden the skin and produce blisters if the solution is prevented from evaporating. **On mucous membranes** it increases the secretions.

Internal Action: In the mouth chlorine usually causes profuse secretion of saliva. In the stomach and intestines it increases the secretions. Inhalation of chlorine gas usually makes the patient cough and increases the secretions of the bronchi.

Poisonous Effects

If large quantities of chlorine solutions are swallowed the following effects are produced:

1. Redness and destruction of the tissues around the mouth.
2. Abdominal pain.
3. Nausea and vomiting.
4. Collapse (cold, moist skin, rapid, thready pulse, slow and shallow breathing).

If the gas is inhaled, the patient has violent coughing; often with bloody expectoration.

The symptoms should be treated with alkalies, such as sodium bicarbonate; for the pain, morphine should be given as well as albumins, milk, or flour to protect the mucous membrane of the stomach.

Uses

Chlorine is used principally to disinfect stools and urine. It is used in the form of chlorinated lime, which liberates chlorine gas. It has a special advantage in removing foul odors. Concentrated chlorine gas, liberated by a specially constructed generator, is used to disinfect rooms. It is very efficient; but it bleaches various dyed materials. It is prepared by placing a dish containing equal parts of black oxide of manganese and salt in the center of the room. To this is added one tablespoonful of strong sulphuric acid diluted

CHOLERA

one-third. Enough chlorine gas will thus be formed to disinfect the room.

Preparations

Chlorine water.—This is a solution containing 4 parts of chlorine gas to 1000 c.c. of water.

It should be freshly prepared, since old preparations may contain hydrochloric acid.

Chlorinated Lime or Bleaching Powder (Calx Chlorinata).—This is a grayish white powder containing 35 per cent. of chlorine gas when fresh. It is sometimes erroneously called chloride of lime. A fresh powder forms a clear solution; otherwise the solution becomes turbid.

Solution of Chlorinated Soda (Liquor Sodæ Chlorinatae) (Labarracque's or Javelle's Solution); dose 10 to 20 minims.

This is a solution made from chlorinated lime and sodium carbonate. It contains sodium hypochlorite and sodium chloride. It liberates about $2\frac{1}{2}$ per cent. of chlorine gas and is used for cleaning medicine droppers, douche nozzles and other small utensils. It is especially valuable to remove stains. It is occasionally given internally in half a tumbler of warm milk.

CHLORODYNE

See ANESTHETICS (CHLOROFORM).

CHLOROFORM

See ANESTHETICS.

CHOLAGOGUES

See CATHARTICS.

CHOLELITHIASIS

For this, and other words beginning with **Chole**—, see GALLSTONES.

CHOLERA (ASIATIC CHOLERA)

Cholera is an acute, specific disease characterized by profuse, painless diarrhea, vomiting, rapid collapse, muscular cramps, and suppression of urine.

Cause: Predisposing: Anything that will lower the resistance, such as bad ventilation, worry, overcrowding, under-feeding, acute infectious diseases. One of the chief causes is gastrointestinal disturbances.

Exciting. The *Spirillum Cholerae Asiaticæ*. The period of incubation is from a few hours to five days. Following cholera, the healthy organism may remain in the stools from eight to ten days, and it has been known to exist sixty

CHOLERA

days. The spirilla die quickly after death of the patient, and there is no contamination of the ground. The organism does not stand drying and dies in a few days on clothing under ordinary circumstances. There is no danger from dust. It resists sunlight for some time but is killed by ten minutes' exposure to a temperature of 122° F. and by ordinary disinfectants.

Source of Infection Is Man.—The organisms are passed in enormous quantities in the stools and at times in the vomitus and the urine. Mild cases of cholera, and germ carriers are the chief sources of infection.

Mode of Transmission: *Water* is one of the commonest modes of transmission. The organism lives a long time in water contaminated by the feces of cholera patients. Uncooked vegetables washed in such water may carry the infection.

Milk may be the source by using contaminated water as an adulterant.

Personal Contact is a common mode of transmission. Persons living together in close contact, eating and drinking out of the same vessel, or handling clothing and bedding soiled with cholera discharges.

Flies are common carriers.

Symptoms.—The disease sets in with mild diarrhea; there may be colicky pain. At first the stools consist of fecal matter and are normal in color; but they soon change to profuse, colorless, watery liquid containing small, opaque flocculi resembling rice water.

Vomiting is an early symptom. It is projectile and like rice water in character. The tissues become dry and shriveled, eyes sunken, nose pinched, cheek bones prominent, skin cyanotic, muscular cramps develop, and secretion of sweat and urine is reduced. Respiration is shallow and rapid; pulse very feeble. There is intense thirst. Surface temperature is subnormal, skin cold and clammy. Rectal temperature 102-104° F. The mind remains clear. The patient passes into coma and dies.

Treatment: *Prophylactic.*—As water is the commonest medium by which infection is spread it is necessary to guard against contamination. All drinking water should be boiled. Avoid uncooked foods. An active campaign against flies should be waged. Avoid all foods which lead to gastro-intestinal disturbances. Wash the hands after going to toilet and before eating. All discharges of cholera patients must be disinfected with equal volume of cresol solution 5 per cent. and allowed to stand one hour, or a 5 per cent. mixture of chlorinated lime may be used; or the feces may be mixed with sawdust and burned. All bedding

CHOREA GRAVIDARUM

and clothing should be soaked in a 2.5 per cent. solution of cresol. Final disinfection should consist of washing floors and walls with a 2.5 per cent. solution of cresol. Vaccination gives immunity for from three to six months.

Curative: The patient should be put to bed and isolated. The room should be airy and well ventilated, but the patient must be kept warm and during collapse external heat should be applied.

Vomiting makes it impossible for the patient to take any nourishment or medicine by mouth. Cracked ice will, to some extent, control the vomiting. Rogers advocates the use of permanganate solution on account of its toxin destroying power. The patient is given all he can drink of calcium permanganate solution 1 to 6 grains to the pint; or a pill of potassium permanganate 2 grains every 15 minutes for two hours, then every two hours until the stools are less copious and more fecal in character. This occurs in from 12 to 24 hours. Then six to eight pills during 24 hours. To replace the loss of fluid from the body, normal saline solution is given by hyperdermoclysis. Rogers has had great success by using a hypertonic solution containing sodium chloride 120 grains, potassium chloride 6 grains, calcium chloride 4 grains to one pint of water intravenously.

Diet: No food can be given during stage of collapse. When vomiting ceases, albumen water, broths, milk diluted with soda water, and then gruels. It is necessary to be careful in increasing diet, as there is danger of bringing on a relapse.

See INFECTIOUS DISEASES, COURSE OF.

CHOREA GRAVIDARUM

When pregnancy occurs in women who are choreic, the movements become worse, and the condition more serious. Occasionally, however, chorea develops for the first time in a woman during pregnancy—chorea gravidarum. These cases are regarded as almost certainly toxemic in origin, and they are extremely serious. The movements become very marked, affecting both sides, and persisting through sleep, so that the patient grows weak and emaciated. Some cases end in spontaneous abortion. Late in the disease the temperature rises, a sign sometimes indicative of endocarditis. The mortality is about 20 per cent. In toxic cases ordinary treatment is unavailing, but rest in bed with complete quiet and mild discipline, combined with free eliminative treatment directed to the bowels, kidneys and skin, is successful in most cases. The results of induction of abortion are so variable that it should rarely be even

CHOREA, HUNTINGTON'S

considered. Non-toxic cases should be treated on the ordinary lines.

CHOREA, HUNTINGTON'S

See HUNTINGTON'S CHOREA.

CHRYSAROBIN

Chrysarobin is a substance obtained from cavities in the *Andira araroba*, a tree growing in India and Brazil. Its active principle is **chrysophanic acid**.

When applied to the skin, it causes redness, pain and even swelling. Large doses, when absorbed from the skin or when taken internally, cause nausea, vomiting, diarrhea and scanty, bloody urine.

It is used principally in 4 per cent. ointments for the treatment of various skin diseases.

Araroba or **Goa Powder**, is the crude powder from which chrysarobin is made.

CIMICIFUGA

Cimicifuga is obtained from the roots and underground stems of the *Cimicifuga racemosa*, an American plant which grows abundantly in shady woods.

It is used as a bitter, to relieve gout and rheumatism, and occasionally to relieve nervousness.

Preparations

Extract of Cimicifuga; dose 5 to 15 grains.

Fluidextract of Cimicifuga; dose 15 to 60 minims.

Tincture of Cimicifuga; dose 1 to 2 drams.

CINCHONA

See QUININE.

CINCHONINE

See QUININE.

CINCHONIDINE

See QUININE.

CIRRHOSIS OF LIVER

See LIVER, SURGICAL CONDITIONS.

CITRIC ACID

Citric acid is an organic acid which is found in the juice of the lemon, or *Citrus limonum*, and the lime, *Citrus bergamia*.

Action

Citric acid acts like acetic acid.

1. It increases the flow of saliva and relieves thirst.

COCAINE

2. It increases the appetite and the flow of gastric juice, thereby aiding digestion.

3. It slightly increases the movements of the bowels. Thus, the juice of half a lemon, if given before breakfast, is a good laxative.

4. It increases the sweat, especially if given hot, as in a hot lemonade.

5. It increases the flow of urine, in which it is excreted as an alkaline carbonate, thereby lessening the acidity of the urine.

6. Citric acid is frequently given on shipboard as an article of diet, to prevent scurvy, a severe disease of the joints due to the lack of vegetable food in the diet.

Citric acid is not a poisonous substance, but its continued use occasionally causes anemia and loss of weight.

It is occasionally used in doses of one ounce to a pint of water, instead of lemonade.

The best way to administer citric acid is in the form of lemonade. To produce sweating it is best given hot.

CLARET

See ALCOHOL.

COCAINE

Coca is obtained from the dried leaves of the **Erythroxylon coca**, a shrub growing in South America.

Cocaine is an alkaloid, the active principle of coca leaves. In the Java coca, in addition to the cocaine, another alkaloid is present: tropacocaine.

Appearance of the Patient

A hypodermic injection of an average dose of cocaine, or its application to the mucous membranes, usually produces insensibility to pain on the area where it is injected or on the mucous membrane on which it is applied. As soon as the cocaine is absorbed, usually in ten or fifteen minutes, if the dose has been large, the patient becomes restless, somewhat more active, and more talkative. He usually feels happy and joyful. The patient often complains of headache, dryness of the throat; the pulse is rapid, strong and small, the breathing is rapid and deep, and the pupils are dilated.

Local Action

Applied to the skin, cocaine produces no effects, but if it is injected under the skin, or applied to a wounded surface, it relieves pain. If it is injected into a nerve, it lessens pain in the area of skin or mucous membrane from which the nerve fibers come.

On mucous membranes: Cocaine relieves pain and makes

COCAINE

the membrane very pale and thin, by contracting its blood vessels. It also checks bleeding by contracting the blood vessels.

The insensibility to pain, or anesthesia, produced by cocaine, lasts only for a short time: for about fifteen minutes to a half hour, depending on the strength of the solution used. As soon as the cocaine is absorbed, the anesthesia and pallor disappear. **Cocaine produces insensibility to pain by paralyzing the nerve endings, in the skin or mucous membranes, which receive impressions of pain.**

The mucous membrane of the eye, nose, pharynx, larynx, esophagus, stomach, urethra, bladder, vagina and rectum, are all affected in this way, if cocaine is applied directly to these mucous membranes, and it is absorbed from all of them. **In the nose**, in addition to the effects on the mucous membrane, it lessens the sense of smell, by paralyzing the nerve endings which receive impressions of smell.

Internal Action

In the mouth: Cocaine has a bitter taste for a short time, as it soon paralyzes the nerve endings in the tongue which appreciate bitter substances. It also lessens pain on the mucous membrane of the mouth, and contracts its blood vessels.

In the stomach: Cocaine acts as a local anesthetic, and it contracts the blood vessels of the mucous membrane. It often lessens vomiting and hiccough, by paralyzing the nerve endings in the stomach, so that impulses which cause vomiting or hiccough are unable to reach the brain.

Action on the intestines: It increases the peristalsis, causing more frequent movements of the bowels.

Action after Absorption

Cocaine is very rapidly absorbed into the blood from all mucous membranes, and from any region of the body where it may be injected; usually in about ten or fifteen minutes. After absorption it affects principally the circulation, the respiration, the brain, the pupil, the kidney, and slightly the muscles.

Action on the circulation: On the heart: Cocaine makes the heart beat stronger and faster.

On the blood vessels: Cocaine makes the blood vessels narrower, by contracting the small muscle fibers in their walls, and increasing the impulses for their contraction, which are sent out from the vasomotor center in the medulla of the brain.

The total effect of cocaine on the circulation is to make the heart beat stronger and faster, and to increase the blood pressure. **The pulse is therefore rapid, strong, but small.**

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Action on the respiration: Cocaine makes the breathing faster and deeper.

Action on the brain: In large doses it increases the activity of every part of the brain. The patient is wakeful, and more susceptible to receive impressions from his surroundings, as a result of the increased activity of the sensory areas of the brain.

The mental activities of the brain are also increased, so that all kinds of mental work such as reasoning, memory, etc., are performed better.

The emotions, especially the pleasant ones, are more active and the patient is somewhat joyful and happy.

Action on the muscles: In large doses cocaine slightly increases the contractions of all the muscles.

Action on the pupils: It rapidly dilates the pupil, usually in about a half to one hour. It does not affect the sight for near and distant objects (accommodation). The effect wears off in about twenty-four hours.

Action on the kidney: Cocaine increases the secretion of urine, as a result of its effect on the circulation and the blood vessels of the kidneys.

Excretion

Cocaine is partly excreted by the urine, but most of it is destroyed in the body.

Poisonous Effects

Cocaine poisoning occurs in two forms: **acute cocaine poisoning**, and **cocaine habit, or chronic cocaine poisoning**.

Acute Cocaine Poisoning

Acute cocaine poisoning results from overdoses of cocaine injected hypodermically, or from its application to the mucous membranes for local anesthesia. The symptoms are due to overactivity of the various organs of the body which cocaine principally affects, followed by exhaustion of these organs, which then produce symptoms of lessened activity or depression. The symptoms vary somewhat in different individuals. Some individuals are so susceptible to the drug that small doses may cause poisonous effects.

Symptoms: 1. Usually the patient becomes quite talkative, happy and jolly, though he may be somewhat confused in his speech and ideas. He is quite anxious about his condition.

2. He is quite active and moves about a great deal.


3. The pulse is very rapid and small, and the breathing is very rapid.

4. The skin is pale, and covered with sweat.

5. The pupils are widely dilated.

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6. Occasionally there may be vomiting.

7. Soon the **delirium** becomes more marked, the patient may seem to see objects about him, he may have muscular contractions of the hands and feet. These are soon followed by either **clonic** or **tonic convulsions**, more often clonic. 

8. Finally the convulsions increase, coma and collapse develop and death ensues.

9. At times there may be no convulsions and no excitement, but sudden collapse and death. Occasionally the patient may be maniacal.

Treatment: 1. Reassure the patient that his condition is not serious.

2. Apply an icebag to the head.

3. The collapse is treated with stimulants.

Cocaine Habit

The cocaine habit is unfortunately very common, and is often induced by its beneficial effects in the nose for the relief of hay fever, catarrh, etc., as well as from its use as a substitute for morphine. It is usually taken in a liquid or powder form. The powder is usually snuffed up into the nose. Many of the cocaine habitués are also addicted to the use of other habit-forming drugs, such as morphine, etc.

Besides the gradual disturbance in the general health, the cocaine habitué develops symptoms:

1. When not under the influence of the drug.

2. After he has received his usual dose.

When not under the effects of the drug, the individual feels depressed and is usually nervous, irritable and has twitching of the hands and arms. He is restless and cannot concentrate his mind on anything, and is unable to do his work.

When he has received his usual dose, the habitué usually brightens up, feels stronger and more energetic and his former symptoms disappear.

After continued use, however, he passes into a weakened condition of both body and mind. He becomes thin, emaciated and anemic. He suffers from various digestive disturbances, a loss of appetite, a foul breath, a drooling of saliva from the mouth, and constipation. He is usually unable to sleep. Frequently, habitués develop ascites.

Finally, however, his mental and moral faculties become undermined and he eventually becomes a burden to himself, his family and friends, and an economic loss to society. He has no will power, no self-control, and does not want to work. He is careless of his person and of his actions. He forgets his responsibilities, neglects his family and develops

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all sorts of base moral tendencies. He usually has various nervous symptoms, such as twitching of the muscles and peculiar sensations on the skin. Many votaries frequently develop hallucinations and a peculiar jumping delirium, and others become insane.

The condition is best treated in special sanitariums; and the method consists of gradually withdrawing the drug.

Uses

Cocaine is the best drug for local anesthesia. It is readily absorbed into the blood, however, and may then cause poisonous symptoms. To avoid these symptoms, it should be remembered that the total amount of any solution of cocaine to be injected should not contain more than half a grain of cocaine hydrochloride, which is its maximum dose.

As a local anesthetic, cocaine is given in the following ways:

1. On mucous membranes, such as the nose, throat or larynx, it is applied with a cotton applicator. A 10 or 20 per cent. solution is used for this purpose.

Occasionally a few drops of a solution of cocaine crystals dissolved in epinephrin or adrenalin, are used. Such a solution contracts the blood vessels very markedly, prevents the absorption of the cocaine and at the same time produces a maximum anesthetic effect.

2. **Infiltration anesthesia.** This is a method of injecting cocaine in very weak solutions, such as a 1:1000 to 1:200 solution. For large areas, large quantities of weaker solutions may be used. For small areas, stronger solutions, such as 4 per cent., may be used. To avoid poisonous effects, the cocaine is often injected together with epinephrin or adrenalin solutions. There are a number of preparations made up in this way. The following are the most common preparations of this kind:

Braun's Solution

This consists of

Cocaine hydrochloride	0.5 to 0.1
Sodium chloride	10.0 to 100.0
Adrenalin chloride solution	0.3 to 0.6

Schleich's Solution

This is made by dissolving 3 tablets, each of which contains

Cocaine hydrochloride	0.03 gm.
Morphine hydrochloride	0.008 gm.
Sodium chloride	0.06 gm.
in 100 c.c. of water.	

CODEINE

The absorption of cocaine is often prevented by tying a tight bandage around the part to be anesthetized, so as to contract its blood vessels.

3. Cocaine is also occasionally injected into the nerve leading from the part to be operated upon. This lessens the sensibility of the area from which the nerve fibers come.

Cocaine is also used to relieve colds in the nose (acute coryza), and to check vomiting and hiccough.

Preparations

Fluidextract of Coca; dose 30 to 60 minims.

Wine of Coca; dose 1 to 4 drams.

Cocaine; dose $\frac{1}{8}$ to $\frac{1}{2}$ grain.

This is seldom used because it does not dissolve readily in water. It does dissolve in oils.

Cocaine Hydrochloride; dose $\frac{1}{8}$ to $\frac{1}{2}$ grain.

For local applications, watery solutions are used in strengths varying from $\frac{1}{2}$ per cent. to 10 per cent. For nose and throat work 20 per cent solutions are often used, or even the powdered cocaine dissolved in adrenalin solution may be used.

CODEINE

Codeine, one of the active alkaloids of opium, is a compound of morphine (methymorphine). Its effects are similar to those of morphine, with the following differences:

1. It does not produce sleep as readily as morphine, and the sleep is very light.

2. It does not slow the breathing as much as morphine, and is therefore safer.

3. It does not produce constipation.

4. It is not so apt to induce the habit.

See MORPHINE and OPIUM.

Preparations

Codeine; dose $\frac{1}{4}$ to 1 grain.

Codeine Sulphate; dose $\frac{1}{4}$ to 1 grain.

Codeine Phosphate; dose $\frac{1}{4}$ to 1 grain.

COD LIVER OIL (OLEUM MORRHUÆ)

Cod liver oil is obtained from the livers of various species of codfish, especially the *Gadus morrhua*.

It consists of the various fats: olein, stearin, and palmitin, and some fatty acids. It also contains very small quantities of iodine, chlorine, bromine, phosphorus, and other substances.

Action

Cod liver oil improves the general condition of the patient if given for some time. It increases the appetite, and it

COLCHICUM

makes the patient stronger, stouter and healthier. Its effect depends largely upon the fats which it contains. These differ, however, from ordinary fats taken in the food, in being more easily digested, absorbed, and assimilated by the body. Cod liver oil is digested in the intestines, and is then deposited as fat in the various tissues and organs of the body, thereby building up the patient.

In overdoses, it causes nausea; occasionally, vomiting and diarrhea.

Uses

Cod liver oil is given principally in "run down" conditions, and in chronic wasting diseases, such as tuberculosis. It is often given together with malt or creosote.

It is usually given only in winter; patients dislike it during the summer months.

Administration

The unpleasant taste and odor of cod liver oil can be disguised in the following ways:

1. By giving the oil in brandy, wine, or lemon juice, in the same way as castor oil (see CASTOR OIL).

2. By taking a little peppermint, and then putting the cod liver oil in the mouth without allowing the lips to touch it, so that the smell does not reach the nose.

All preparations of cod liver oil should be given about three quarters of an hour to an hour after meals, the time when most digestion takes place.

In children, when it cannot be given by the mouth, cod liver oil may be rubbed on the skin of the chest or abdomen, before retiring, as it is readily absorbed from the skin.

Preparations

Cod Liver Oil (*Oleum Morrhuæ*); dose 1 to 4 drams.

Emulsion of Cod Liver Oil; dose 1 to 2 drams.

This contains 50 per cent. of cod liver oil.

Emulsion of Cod Liver Oil with Hypophosphites; dose 1 to 2 drams.

COFFEE

See CAFFEINE.

COFFEE HABIT

See CAFFEINE.

COGNAC

See ALCOHOL.

COLCHICINE

See COLCHICUM.

COLCHICUM (MEADOW SAFFRON)

Colchicum is obtained from the seed, *Colchici semen*, and underground stem, *Colchici cormus*, of the meadow saffron

COLCHICUM

or *Colchicum autumnale*, a small plant growing in Europe. The active principle is an alkaloid **colchicine**.

Appearance of the Patient

An ordinary dose of colchicum causes very little effect, but several hours after a moderate dose is given, the patient complains of some abdominal pain, perhaps of a little nausea, and later he has frequent movements of the bowels and the urine may be somewhat increased. The pulse may be a little slower and occasionally the tears, saliva and sweat are somewhat increased.

If the patient is suffering from an attack of acute gout, the severe pains of this condition are usually relieved.

Local action: Applied to the skin or mucous membranes, it acts as an irritant.

When given internally it irritates the mucous membrane of the stomach, causing nausea and vomiting.

It is slowly absorbed from the stomach. After absorption it principally affects acute gout. It also increases the secretion of urine. Large doses make the pulse and breathing somewhat slower.

Poisonous Effects

Colchicum is very violent poison, small doses having caused death. An overdose of colchicum usually causes the following symptoms within a few hours:

1. Severe abdominal pain.
2. Nausea, and continual profuse vomiting, which is accompanied by profuse secretion of saliva, tears and mucus from the nose.
3. Profuse diarrhea, often with bloody stools.
4. Scanty and bloody urine, or there may be no urine secreted at all. Occasionally the urine may be increased.
5. Spasms of the muscles, even convulsions, followed by great muscular weakness, with slow movements and paralysis.
6. Collapse (rapid, thready pulse, slow and shallow breathing, cold moist skin).

Death soon results from respiratory paralysis.

Treatment

1. Give tannic acid preparations, to neutralize the colchicum.
2. Wash out the stomach.
3. Protect the mucous membrane by white of egg, milk, etc.
4. Keep the patient quiet.
5. The collapse is treated with stimulants, such as caffeine, strychnine, etc.

COLD

Preparations

Extract of Colchicum Stems; dose $\frac{1}{2}$ to 2 grains.

Wine of Colchicum Seeds; dose 10 to 60 minims.

This contains 10 per cent. of colchicum and is the preparation commonly used.

Fluidextract of Colchicum Seeds; dose 2 to 5 minims.

Tincture of Colchicum Seeds; dose 5 to 15 minims.

Colchicine. (the active principle); dose $\frac{1}{120}$ of a grain.

COLD, APPLICATION AND EFFECTS OF

Action of Cold:—

1. *On the Skin, Mucous Membrane and Adjoining Tissues.*—Cold contracts the involuntary muscles in the skin and this gives it the appearance of gooseflesh. The resulting pressure squeezes the blood out of the capillaries. Cold also causes the contraction of the blood vessels in the skin. An inflammatory process, if present, will be checked.

2. *On Nutrition.*—Cold is a vital depressant. It checks the activities of all living things.

3. *On Bacteria.*—Cold checks the growth and activities of bacteria as they, like the body cells, are made of protoplasm. In this way cold checks inflammation and the process of suppuration, if present.

Action of Cold, if Prolonged:—

1. *On the Nerves.*—Prolonged applications deaden nerve endings and in this way will destroy all sensation.

2. *On the Blood Supply.*—By lessening the blood supply to the part, they interfere with its supply of food and oxygen.

3. *On Nutrition and Function.*—Cold, if too prolonged, lowers the temperature and lessens the activities of the cells to such a degree that the function of the part may be completely lost. It may even cause death of the part.

Symptoms and Signs to be Avoided in Making Cold Application.—A blue, purplish, mottled appearance of the skin, with numbness or stiffness of the part, indicates that the tissues are in danger of injury, death and sloughing. Should these symptoms appear, the application should be removed and the condition reported to the doctor. When these signs are present circulation in the part should be stimulated, not checked.

Conditions and Purposes for which an Ice-Bag or Cold Compresses are Commonly Used:—

1. To check inflammation and congestion; to prevent or reduce swelling; to relieve pain; to check bleeding and discoloration in such conditions as the following: A bruise, wound, burn, sprain, fracture, acutely inflamed joint, hemorrhoids, phlebitis, tonsillitis and diphtheria, etc.

COLD IN THE HEAD

2. To check inflammation and prevent suppuration or abscess formation in an infected finger or wound, a styne, boil, or abscess in a tooth or ear.

And see ICE-BAG.

COLD IN THE HEAD

See CORYZA and COUGH and COLDS.

COLIC, IN CHILDREN

Colic is usually a result of gas or air in the stomach or intestines, or it may be indirectly due to constipation or unsuitable food, or to cold.

Symptoms.—As the gas presses on sensitive parts and on nerves, the pain is very sharp and severe and the child instinctively draws up the legs towards the body, as this position relaxes the muscles of the abdomen which are tense and hard. The child's cries are hard and strong and are repeated at intervals until relieved.

Treatment.—If the gas is in the stomach, put the child over your shoulder and pat the back. Give warm water with a little bicarbonate of soda or peppermint in it. Lay the child, face downward, with the abdomen over a hot water bag for heat and pressure, which relieves the pain, or put the feet in hot water and mustard, lubricating the feet first to prevent the skin being irritated. If the colic is severe, an entire hot bath can be given, which relaxes the muscles, allowing the gas to pass off more easily. An enema of soap suds with ten drops of turpentine added to it will usually give the quickest relief, or even inserting the rectal tube and leaving it in the rectum aids in expelling the gas. Rubbing the abdomen also provides relief.

COLLAPSE

The symptoms and treatment of collapse are the same as in shock. The conditions are identical but the term collapse is usually used when the prostration is the result of disease whereas the term shock is used when it is the result of a surgical condition such as an accident or operation.

See SHOCK.

COLLARGOL

Collargol (colloidal silver Credé) is a solution of very finely divided silver, in albumen, containing about 85 per cent. of silver. It is used as an antiseptic both locally, and injected into the blood.

It is often given by direct injection into the veins, in cases of sepsis, in $\frac{1}{2}$ per cent. solutions. It is also used in

COLON IRRIGATION

the form of bougies, vaginal suppositories and dusting powders.

Collargol Ointment.—This contains 15 per cent. of collargol. It is used principally in acute mastitis, or inflammation of the breast. About 30 to 60 grains are rubbed thoroughly on the skin.

The dose of collargol is 1 grain.

COLLES' LAW

A man with tertiary syphilis may procreate a syphilitic child without apparently infecting the mother. In such cases the mother can nurse the child without acquiring the disease, whereas a wet nurse cannot do so. This is known as Colles' Law. The explanation is either that the mother has had a very mild attack without any external manifestations, and so acquired immunity; or that an immunity has been transmitted from the fetus to the mother.

COLLODIUM (Collodion)

This is a 4 per cent. solution of pyroxilin or soluble gun cotton, in alcohol and ether. When collodion is applied to the skin, the alcohol and ether evaporate, leaving a colorless, transparent contractile film, which is strongly adherent to the skin and protects it.

Flexible Collodion contains Canada turpentine and castor oil in addition to the other ingredients, and is more pliable.

Styptic Collodion contains 20 per cent. of tannic acid and is therefore astringent. (See TANNIC ACID.)

COLOCYNTH

Colocynth is the pulp of the bitter cucumber or *Citrullus colocynthis*; its active principle is **colocynthin**, a resinous substance.

Preparations

Extract of Colocynth; dose 2 to 5 grains.

Compound Extract of Colocynth; dose 3 to 15 grains.

Containing colocynth, aloes, scammony and cardamom.

Colocynthin (active principle); dose $\frac{1}{12}$ to $\frac{1}{6}$ of a grain.

See CATHARTICS.

COLON IRRIGATION, OR ENTEROCLYSIS

Conditions and Purposes for which Colon Irrigations are Given.—1. After operations for the following purposes:

(a) To thoroughly cleanse the large intestines of excess mucus, feces, toxic and putrefying matter. Colon irrigations are particularly valuable after operations on the alimentary tract or on the gall ducts.

COLON IRRIGATION

(b) To stimulate peristalsis and relieve flatulence.

(c) To supply heat as a stimulant in shock or collapse.

(d) To supply fluid to the body in order to increase the volume of blood, raise the blood-pressure and stimulate the heart; to relieve thirst; to supply fluid lost by vomiting, diarrhea, or hemorrhage; to dilute toxins in the body; to stimulate and flush the kidneys and relieve suppression.

2. In constipation.

3. In obstruction; the pressure must be low; the solution must be given slowly, the flow being constant, not jerky.

4. In dysentery, to cleanse from mucus and pus, and to dilute the toxins.

5. In inflammatory diseases of the lining of the large intestines, to supply local remedies such as tannic acid, boric acid, etc.

6. In inflammation of the kidneys and pelvic viscera.

7. In colic—hepatic, biliary, renal, or intestinal—to relax the muscles and relieve pain.

8. In toxemia and uremic poisoning, to dilute and help eliminate the poisons.

9. In poisoning from bichloride of mercury, etc., in order to dilute and remove the poison from the intestines and body, to stimulate and flush the kidneys, and to prevent its destructive effect upon them and the resulting danger of acute nephritis and suppression, which might prove fatal.

The Important Factors to Consider in Giving the Treatment in order to Get the best Results.—1. The *articles* required for the treatment will depend somewhat upon the method.

(a) *For the patient and bed.*—A blanket will be necessary to cover the patient; a towel and Kelly pad will be required to protect the bed and direct the return flow of the solution into the receptacle on the floor.

(b) *For the treatment* will be required an irrigating pole, irrigating can with tubing, clamp and connecting tip attached, a covered basin with two rectal tubes of suitable size, one larger than the other, vaselin for lubrication, a pail for the return, a large pitcher (2 gallon) with the solution and a basin of soap and water, sponges and towel for cleansing and drying the patient.

2. The *solution* used depends upon the purpose. It may be:

(a) Normal saline is usually used for cleansing. Medications may be added to the solution, if desired.

(b) Plain water is used when the treatment is given to relieve thirst or to stimulate the kidneys or to supply fluid for any reason.

(c) Potassium acetate (one dram to a pint) is frequently added for its diuretic effect.

COLON IRRIGATION

3. The *temperature* of the solution is usually from 116 to 120° F.

4. The *amount* of solution used is usually from two to three gallons. When given for cleansing purposes the amount is determined by the result, as the treatment is continued until the return is clear.

5. The *rectal tubes* used and the way in which they are inserted also depend upon the purpose. When used for cleansing purposes, the inlet tube should be smaller than the outlet tube (a catheter may be used) in order to allow for the return not only of the fluid but of the feces, flatus, and mucus, etc. The inlet tube should be inserted about 6 inches while the outlet tube is inserted about 3 or 3½ inches. Each tube should be marked with a narrow strip of adhesive plaster indicating when the tube has been inserted the desired distance and whether meant for the inlet or outlet of fluid. When inserted the adhesive marks on the tubes are opposite and just without the anus. If the injection is given to supply fluid, in order to have some of the fluid retained, the tubes should be about the same, or the outlet tube should be a little smaller than the inlet tube. For the comfort of the patient medium sized tubes only should be used.

Position of the Patient.—Some prefer to give the treatment with the patient drawn to the side of the bed, in the left Sims' position, that is, on her 'left side with the knees flexed, the right slightly more than the left. In this position the fluid is carried by gravity into the sigmoid and descending colon and by antiperistalsis may be carried to the ileo-cecal valve.

Others prefer the right Sims' position. When in this position, the solution is carried by gravity along the sigmoid and descending colon, and down the transverse colon to gradually collect in the ascending colon and cecum. Care should be taken not to use more water than is necessary and not to overdistend the bowel.

In obstinate intestinal obstruction, when irrigations with the patient in the above positions fail to bring about evacuations or relieve the condition, sometimes the *knee-chest position* is used. The *advantages* of this position, in irrigating the colon, are that it allows the solution to run in easily by gravity so that it reaches all parts of the colon and removes threadworms, excess mucus or accumulated feces from the cecum and entire colon. The *disadvantages* are that it is very trying and apt to be exhausting, particularly to a patient already weakened by disease. In all cases the patient must be carefully supported by an assistant and the treatment given as gently and skilfully as possible.

COMPOUND CATHARTIC PILLS

Method of Procedure.—Hang the irrigating can about 3 feet above the bed; attach the tubing, clamp and inlet tube; pour the solution into the can; allow the solution to run through the tubing to expel the air and warm the tubing; then clamp it. Lubricate both the tubes and insert them both at the same time. This is easier and causes much less distress to the patient; when one is inserted the sphincter of the anus closes tightly on it, making it very difficult to insert the second tube. Sometimes the insertion of the two tubes together is made more easily if a hole is made in the side of the outflow tube into which the end of the inflow tube is inserted. They are thus inserted as one tube. After they are inserted to the mark on the inflow tube, both tubes are then adjusted so that each is inserted the desired distance as indicated by the markers on the tubes. The end of the outflow tube should be about a foot below the level of the patient in order to avoid too great suction. This would be apt to draw the mucous membrane into the holes in the outlet tube, and not only interfere with the return, but also injure the delicate membrane. If the outflow colon tube is not long enough to permit this it should be attached by a connecting tip to another piece of tubing. Also if this tubing does not extend to within about a foot of the pail on the floor, when considerable gas is expelled it will scatter the fluid and fecal matter, soiling the bed, etc. When the distance from the pail is too great, the noise and splashing are also objectionable. Inject the solution slowly so as not to excite the bowel to contraction. This allows the desired amount to be given and secures the desired effect—thorough cleansing or retention, etc. Very little force should be used.

If the patient complains of abdominal pain, clamp the inlet tube for a few seconds and note whether flatus is expelled or not—pain is frequently due to the contraction of the muscles in the effort to expel the gas. If the pain is continuous, stop the treatment. If properly given there is usually no pain. If there is difficulty in obtaining the return, move the outlet tube up or down. It may be necessary to remove and cleanse it. Stop the treatment if the patient shows signs of exhaustion.

When the desired effect has been attained remove the tubes gently; cleanse the patient; remove the Kelly pad and dry the parts. If the parts are irritated a soothing ointment should be applied.

COMPOUND CATHARTIC PILLS

See CATHARTIC PILLS.

CONIUM

COMPOUND SPIRITS OF ETHER (HOFFMAN'S ANODYNE)

Compound spirits of ether, or Hoffman's anodyne, is used principally to lessen nervousness and calm the patient. It also checks the formation of gas in the stomach. Its effect is due principally to the ethereal oil which it contains. Dose 30 to 60 minims.

COMPRESSION OF BRAIN

See BRAIN.

CONFECTIONS

Confections are preparations of drugs made up to disguise the taste of unpleasant tasting substances. They are usually made up with honey and sugar.

CONFINEMENT, DATE OF

Estimation of the Probable Date of Confinement.—In women who have been menstruating normally the nearest approach to an accurate estimate is obtained by calculating from the last menstrual period. It is assumed that the fertile coitus occurred just after the last period. Therefore calculating *from the first day of the last period*, which is generally the date remembered by the patient, allowance of four days is made for menstruation, and another three days before fertilization occurs, making in all seven days from the start of the last period. Adding these seven to the 273 of normal gestation, we conclude that labor is likely to ensue 280 days from the beginning of the last menstruation. The actual date is estimated roughly by adding the seven days and counting forwards nine calendar months, or backwards three months.

For example, supposing a woman began her last menstrual period on the 3rd of September, add to that 7 days, bringing us to the 10th, and count forwards nine months or backwards three. The date of probable confinement is the 10th of June.

It must always be remembered that this date is merely an *approximate* one, and many cases will be found to terminate a few days earlier, or as much as three weeks later. The explanation of the latter is that the fertile coitus occurred not just after the last period, as was assumed, but just before the first period missed.

See LABOR.

CONIUM (SPOTTED HEMLOCK)

Conium is obtained from the fruit and flowers of the **Conium maculatum**, or poison hemlock, a European plant. Its active principle is *coniine*, a liquid alkaloid.

CONSTIPATION

Applied locally, conium causes intense redness and swelling.

When taken internally, it acts like gelsemium, causing muscular weakness by paralyzing the nerve of the muscles. In large doses it makes the breathing slower.

Poisonous Effects

Symptoms.—1. The lower extremities become weak and heavy. The patient lies down because of the weakness. If he attempts to walk, he staggers and falls. The eyes may be turned in, the lids may droop, and the pupils are dilated. The patient complains of headache and he can hardly lift his head.

2. The pulse is slow at first, but soon becomes rapid and weak.

3. The skin is moist and cold.

4. The breathing becomes slow and shallow, and the patient dies in a short time from arrest of breathing.

Uses

Conium is very rarely used at present, possibly once in a great while to lessen the spasms of whooping cough. It is a very dangerous drug.

Preparation

Fluidextract of Conium; dose 2 to 8 minims.

CONSTIPATION

Constipation is at all times a serious menace to a healthy condition of the body. When this exists the residue or waste of one part of the body is not expelled in the normal way by the muscular action of the colon but is retained in the system longer than usual and from this there is an absorption back into the tissues with the result that the patient has the symptoms resembling those of an enervating, slow poison, with consequent lack of energy, heaviness and irritability, besides the distress of an accumulation of gas in the abdomen.

In time of illness there is a **natural tendency** to constipation due to the lack of general exercise and the consequent inactivity of the muscles of the intestines; and also because the diet at such times consists of more condensed food, most of which is absorbed without leaving sufficient waste to stimulate the muscles of the colon and keep them active.

Treatment. The influence of **the habit** of evacuating the bowels at a **regular** hour each day has the most permanent effect in overcoming constipation, and even in time of illness this has proved an efficient help towards counteracting this tendency.

CONSTIPATION

Exercise the muscles of the legs which directly affect the intestinal muscles. The simplest way of doing this is to walk (even walking up and down stairs). If exercise can be combined with pleasure, so much the better.

Rub the muscles of the colon in the natural direction up the right side, across the top and down the left side.

Allow the patient to drink freely of water because fluids, being absorbed in the large intestines, stimulate the muscles there. Also give fruit and green vegetables for the sake of the mineral salts contained in them, which have the same effect. The fiber of the vegetables, well cooked and unstrained, as well as coarse grained cereals and breads are valuable in the diet as all of these leave more bulk or waste which is not absorbed, and their presence in the colon stimulates the muscles to act and expel the feces from the rectum.

An enema or laxative is frequently given to overcome this condition when other efforts fail.

CONSTIPATION, POST-OPERATIVE

Most people after operation are very constipated. Constipation has very serious sequelæ and the importance of impressing upon the patient's mind the necessity of a daily movement of the bowels cannot be over-emphasized. There should be a regular time for moving the bowels, which should be observed conscientiously. The best time is shortly after breakfast; the patient should remain seated on the toilet for at least five or ten minutes, and then if there is no desire to move the bowels, a glycerin suppository should be inserted to stimulate the movement. Provided there is no contraindication to any of the coarser vegetables, the patient should be placed upon the anti-constipation diet.

Diet for Anti-Constipation.

Breakfast

Any fruit, fresh, cooked, preserved, or dried.

Shredded wheat, Thomas uncooked wheat biscuit, or oatmeal, or toasted corn flakes with cream if possible, otherwise a small amount of milk and sugar or molasses.

Bread.—Use only graham, rye, bran, whole wheat or corn bread.

Butter, jam, jelly, or honey. Coffee with cream and sugar.

Luncheon and Dinner

Soup.—Any kind except those thickened with flour, or containing milk.

Fish.—Meat, or eggs in moderation. Eat as much of the fat as possible.

Vegetables.—Fresh or canned in any quantities. Green salads with olive oil.

CONTAGIOUS DISEASES

Desserts.—Fresh fruit or fruit cooked or preserved is best; also jellies prepared with coffee, wine and lemon, etc. Water ices may be eaten freely but only small amounts of ice cream may be taken. The undercrusts of pies may not be eaten.

General Directions.—Take at least a glass of water before breakfast, one in the middle of the day, and one at night. In addition take as much water as may be desired. This may be plain water, vichy or any carbonated water. Butter-milk, sour milk, cider, beer, and white wine are allowed. Butter in any quantity is permitted.

Avoid tea, red wine, milk and whiskey, white bread, noodles, vermicelli, macaroni, cake, rice, barley, potatoes, and cheese.

General Rules.—Have a regular time for going to the toilet. Take a daily walk in the open air. Practise the setting-up exercises daily.

Setting-up Exercises.—

1. Knees stiff; bend forward and try to touch floor with fingers.
2. Bend body backward from hips.
3. Bend body to the right and left from hips.
4. Rotate to the right and to the left on hips.

CONTAGIOUS DISEASES, NURSING CARE OF

In caring for patients ill with a contagious disease, remember that contagion is spread either by *direct* or *indirect contact*. *Direct contact*—with patient or discharges. *Indirect contact*—Utensils or articles which have been infected by the patient who has a contagious disease.

These patients should be isolated, and the isolation room equipped with all articles and utensils necessary for the care of the patient, and the cleanliness of the room.

When the patient is discharged, all articles must be disinfected. Fountain pens, a watch or anything with a hard surface, may be wiped off carefully, with carbolic solution. Books cannot be disinfected. They should be burned if the patient has been in contact with them while he is in an infectious stage.

A gown should be worn by the attendant, even though the contact with the patient may be slight. A nurse carrying utensils or waste material from the isolated room must wear a gown until the articles are deposited.

When a gown is removed, wash hands before removing. Hang the gown, folding the insides together, that the infected portion may not touch the clean surface. Wash the hands again.

Nurses must wash their hands before giving diets, after

CONTAGIOUS DISEASES

giving treatment, after touching the patient or any utensil which may be infected, and after leaving the room.

Every nurse should be sure that visitors do not carry contagion. Visitors' clothing, while in the room, should be entirely covered by a gown. After removal of gown, hands should be carefully washed before putting on wraps.

Patient's tray may be prepared in the kitchen. Before carrying the tray to the patient, place a large pan of water on the stove to boil; on returning to the kitchen, the nurse, wearing a gown, must burn all refuse, and place the tray and dishes in the pan of boiling water, which must entirely cover the articles to be sterilized. They should boil for twenty minutes.

Infected clothing may be wrapped in a clean sheet and placed in boiling water for twenty minutes.

A patient ready to be discharged may be taken to the bathroom, and standing upon a clean sheet, disrobed, placing infected clothes upon the sheet which is wrapped around them, later to be placed within boiler as directed above.

The patient is bathed, hair shampooed, and when dressed in clean clothing may be released. The tub must be disinfected.

All washable articles should be boiled, and all furniture which may have been infected by the patient, disinfected. All discharges and waste materials must be disinfected or cremated.

If a patient dies, the body is prepared in usual manner, and wrapped in a sheet which is saturated with a 1 : 500 solution of bichloride of mercury.

General Care of Patient.

A daily bath is necessary, especially in the exanthemata.

The mouth should be kept clean, and if the lips are dry, anoint them with boric ointment, unless otherwise ordered. Collection of dried mucus is to be removed from the nose as often as necessary; care must be taken not to cause abrasions, for thus a larger field is made upon which the organisms may grow. Mucus may be softened by carrying boric ointment well up into the nose, never using force, and when the discharge is softened, it may be removed with a swab, dipped in warm boric acid solution.

Unless otherwise ordered, nurses must give fluids frequently. Watch all discharges, and report any abnormality.

Measure and note the quantity and the color of the urine. Report any change in character.

Report vomiting immediately. In an apparently convalescent patient, there is no more alarming symptom.

CONTUSIONS

Watch for and report edema, and if this symptom occurs, keep the patient quiet and warm until the doctor arrives.

Always watch the pulse carefully.

Liquid diet is to be given until other orders are received from the physician.

Fresh air and warm covering, sufficient to render the skin warm to the touch.

Bowels to be kept open. Have an order from the attending physician for type of cathartic most suitable for the disease.

Nurses' Care of Herself

If a patient coughs in face, wash immediately.

If discharges are coughed into the eyes, irrigate thoroughly with warm boric solution, followed by argyrol. *Delay may cause loss of sight.*

Wash hands before using handkerchief, before eating, before and after giving treatments, and when leaving patients.

If there is an abrasion on the skin, or around the nails, keep it covered, so that it will not become infected.

Never eat or drink infected food or use infected dishes.

Rest when possible, and have some recreation away from the patient, taking all precautions that no contagion is carried from the patient to other people.

There is no reason why nurses who care for contagious diseases should not mingle with other people if they are conscientious in carrying out their technique.

When leaving the patient, the same care must be taken in disinfecting that was given the patient.

CONTUSIONS

A contusion is a bruise caused by a blunt force such as a kick, blow or crushing injury. There is no wound in the skin but a subcutaneous laceration with stretching and tearing of many minute blood vessels.

Contusions are often associated with wounds and other injuries. Head injuries are always dangerous and should be treated for fracture of the skull. Injuries to the chest are usually followed by severe shock which may be profound. A blow to the pit of the stomach spoken of as a "blow to the solar plexus" may cause instant death. The danger of internal injury is also very great in blows, etc., on the abdomen and symptoms of such an injury should always be watched for. A fracture of a bone may also occur without external signs.

The **symptoms** of a contusion are pain, swelling, heat, discoloration and loss of function. The part is first red, then

CONVALESCENCE

as the blood stagnates, blue-black, changing to violet, green, brown and yellow as the hemoglobin is gradually decomposed and the products finally reabsorbed. The blood works its way slowly to the skin. The discoloration may appear within a few hours or not for hours or days, depending upon the blood supply of the part and the depth of the injured vessel. Where the tissue is loose, as in the eyelids, a "black eye" develops almost immediately, whereas on the thighs or buttocks the thick muscles and dense fascia may prevent its appearance for days, when the cause of the bruise may be entirely forgotten.

When bleeding occurs from a large vessel forming a circumscribed collection of blood enclosed by the tissue, it is called a hematoma—a blood tumor.

The **treatment** consists in the local treatment to control the bleeding and restore the vitality of the part and the treatment for shock. The *local treatment* depends somewhat upon its extent—rest, elevation where possible and applications of heat or cold are used. A splint may be used to secure rest. Cold compresses may be used in the early stages and when the bruise is not extensive. Evaporating lotions such as lead and opium are cooling and give great relief when left uncovered to allow for evaporation. Wet dressings of lead and opium are also used. They are mildly antiseptic, astringent and soothing. Wet dressings of aluminium acetate are sometimes used. Aluminium acetate is mildly astringent and antiseptic.

Magnesium sulphate solution acts as an anesthetic and relieves pain. An ice-bag as an application of cold must be used with extreme care. Its weight causes discomfort and the intense cold may cause gangrene when the tissues are badly injured and thus vitality lowered. All extensive bruises are best treated by hot antiseptic solutions. The danger of infection in the weakened tissue should be kept in mind.

After cold applications have controlled the bleeding, they are no longer desirable. The part should be bandaged with even pressure and heat applied to aid absorption and restore the vitality of the part. Massage may be used later to restore the vitality. It should never be used soon after severe bruises because of the danger of embolism.

See WOUNDS.

CONVALESCENCE

Convalescence really means getting back, step by step, to normal responsibilities and the further away a patient's mind can be directed from the idea of illness, so much quicker will the progress be. If overtired, patients become discouraged, irritable and depressed, all because they have

CONVULSIONS

done more than physical strength allows. Two steps forward and one step back is discouraging—rather one and a half steps forward and no overtiredness.

Entertaining convalescent children.—To meet the need during a child's convalescence, it is equally necessary to prevent their being overtired and overentertained as in the case of adults. Do not give too many toys at one time. Let the child get all the diversion he can from one and when tired of that, take it away and give another. A child will play with much less nerve strain when he is evolving things himself than when closely observing what another does.

CONVULSIONS

Convulsions are violent, involuntary muscular contractions. The contractions may be continued or intermittent and may be local or general.

Convulsions may be classified according to (1) the character of the contractions; (2) as to whether they are local or general; and (3) the cause of the convulsion and origin of the irritation; that is, whether the convulsion is due to irritation or irritability of the motor centers of the brain or of the spinal cord.

Character of the Contractions.—Contractions which are intermittent, the muscles alternately contracting and relaxing, are called *clonic*. The movements are abrupt and jerky.

Contractions which are long continued are called *tonic*.

Both tonic and clonic contractions may occur in the same convulsion and frequently follow each other.

Coördinate contractions are clonic contractions in which the movements seem purposeful. They are an exaggeration of the natural contractions.

Cause and Origin of the Irritation.—Convulsions which result from excessive irritation or irritability of the motor centers of the brain are characterized by loss of consciousness. They are called *epileptiform* convulsions and are commonly spoken of as *fits*. The contractions are chiefly clonic but may be preceded by a short tonic contraction. The convulsions are general.

Epileptiform convulsions may be caused by: (1) Idiopathic epilepsy; (2) injuries to the head with concussion, laceration of the brain, or pressure on the brain from hemorrhage or a fractured skull; (3) organic brain diseases due to meningitis, syphilis, tumors, abscesses or apoplexy; (4) toxic substances in the blood as in the acute infections, alcoholism, uremia and in poisoning by certain drugs; (5) reflex irritation as in the convulsions in young children resulting from gastric disturbances, intestinal parasites, teething, an adherent prepuce,

CONVULSIONS

the onset of an acute disease, or any condition accompanied by a rise in temperature; (6) cerebral anemia resulting from a profuse hemorrhage or from certain forms of heart disease.

Tetanic convulsions may result from:—(1) Tetanus or lock-jaw; (2) cerebrospinal meningitis; (3) strychnine-poisoning; (4) tetany.

Hysterical convulsions are manifestations of hysteria, a disease of the nervous system. The convulsions may simulate those of epilepsy or any of the above forms so are not characteristic. They differ from those of epilepsy and other convulsions originating in the centers of the brain in that while the eyes are closed and the patient may seem to be unconscious he seldom loses consciousness completely and will often respond to suggestion. For instance, a patient may recover on hearing a suggestion to pour a bucket of cold water over him. Suggestion is one of the methods used in treating hysterical patients. Other points of differentiation are that the movements are usually tonic, not clonic, the pupils react to light, there is no involuntary passage of urine, biting the tongue, frothing at the mouth, change in the pulse or in the color of the face. The patient may fall but in a place and manner in which he cannot hurt himself. In convulsions from other causes, a patient may receive severe injuries in falling. The attacks of hysteric convulsions are usually not sudden; there may be screaming, laughing or crying during the attack and it may be more prolonged than in epilepsy and other forms. After recovery, the patient is often excited, restless, and emotional, and may laugh or cry, whereas in epilepsy the patient usually sleeps for an hour or more after the attack.

Eclampsia is a sudden attack of general convulsions usually of the epileptiform type. The term is applied to the convulsions occurring in infancy as a result of reflex irritation, and to those occurring in women during pregnancy, labor, or the puerperium as a result of toxic materials retained in the blood.

The Treatment.—Coolness, presence of mind, and promptness in action are necessary in the treatment of convulsions from any cause. The patient should be placed in the recumbent position with his head slightly elevated and in a place (in bed if possible) where he cannot hurt himself. His movements may be guided so as to prevent injury to himself but should not be restrained. A gag should be placed quickly between the teeth to prevent him from biting his tongue. His clothing should be loosened and fresh air admitted freely.

A patient should never be left alone while in a convulsion. The symptoms of the attack should be carefully noted and

COOKING

reported to the doctor on his arrival. Further treatment must depend upon the diagnosis and will be ordered by the doctor.

The *chief points to observe* about convulsions as an aid to diagnosis are as follows:

1. The time of the attack.
2. The onset of the attack, whether sudden, or preceded by a warning, or by nervous or emotional disturbances.
3. The character of the contractions, whether tonic, or clonic, whether one form follows the other, or whether the movements are coördinate or not.
4. The area involved, whether local or general, and if local the part affected.
5. The muscles first affected and the order in which other muscles are involved.
6. The frequency and duration of the convulsion.
7. Whether the patient is hypersensitive, conscious, semi-conscious, or totally unconscious.
8. Relaxation of the sphincters with involuntary movements of urine or stools.
9. The appearance of the eyes, whether closed or open, fixed, squinting, the pupils dilated, contracted or irregular.
10. The appearance of frothing at the mouth.
11. Any change in the pulse, respiration, or the color, or expression of the face.
12. The condition of the patient following the convulsion.

Convulsions in children have the same significance as a chill in an adult. They may mark the onset of an acute infectious disease such as scarlet fever or pneumonia, or may be a symptom of cerebral diseases such as meningitis, hydrocephalus, a brain tumor or abscess; or may be due to some minor cause such as teething, or constipation, or to violent emotion in a nervous, excitable child. Owing to their unstable nervous system minor causes or irritation may cause a convulsion in children.

The Treatment.—A doctor should be summoned immediately. During the convulsion the child should be placed in a hot bath (98° to 105° F. for 1 to 2 minutes) or a mustard bath or pack in order to relax the muscles. Cold applications should be applied to the head. When the attack is due to gastro-intestinal disturbances a lavage may be given and a hot enema followed by a purgative—castor oil is commonly used. The child should be watched closely following the convulsions and preparations made ready for repeating the treatments, as the attacks are apt to recur.

COOKING

Effect of Cooking upon Food.—It has been proved that the diet of man can be made more effective for his needs

CORNSILK

if the raw materials are prepared before they are eaten. This preparation of food is known as cooking. Food is cooked, then, for certain definite reasons, namely: (1) to increase its digestibility; (2) to destroy the parasites and harmful bacteria which may infect it; and (3) to stimulate the appetite by developing its flavor and appearance.

COPAIBA

An oleoresin obtained from the sap of a tree growing in Brazil and other South American countries.

When applied locally, it reddens the skin or mucous membranes.

When taken internally, it checks the formation, and aids in the expulsion of gas from the intestines, and acts as a cathartic. It is absorbed from the stomach and intestines, but produces no effects, except a slight reduction of temperature.

It is eliminated by the urine and expired air, acting as an antiseptic on the mucous membranes of the organs through which it is excreted. It slightly increases the flow of urine.

It is used principally as an antiseptic for gonorrhea, cystitis, etc.

Large doses often cause nausea and vomiting and various rashes, such as urticaria.

Preparations

Copaiba; dose 10 to 30 minims.

Oil of Copaiba; dose 10 to 30 minims.

COPPER (CUPRUM)

Copper is a metal, some salts of which are occasionally used as drugs.

Preparation

Copper Sulphate (blue vitriol or blue stone); dose as an astringent $\frac{1}{4}$ to 2 grains, as an emetic 5 to 10 grains.

It is used principally to contract the granulations which form in the eyelids in trachoma, an infectious disease of the eyelids.

It is also used to produce vomiting, as an astringent, and occasionally to destroy tissue (escharotic action).

CORD, LIGATURE OF

See **LABOR, MANAGEMENT.**

CORNSILK

See **ZEA.**

CORYZA

CORYZA (COLD IN THE HEAD)

This is an inflammation of the mucous membrane of the nose and the throat, and often of the eyes as well, with a very free discharge of mucus which may extend to the trachea or even bronchial tubes.

Treatment. Give the patient a warm bath and a laxative and keep in bed for a few days. Some relief is obtained by inhaling steam from a solution of benzoin (1 teaspoonful to a pint of water—or the same amount of pulverized camphor) and for this treatment a paper cone can be made of newspaper or brown paper to extend from the kettle to the patient. Gargling the throat with an astringent, such as lemon juice, glycerin, water and soda or very hot saline solution, may provide relief.

Give fluid drinks, such as hot lemonade and plenty of water. To allay irritation of the surface of the throat, which frequently causes coughing, give the white of egg with a little lemon juice in it. Apply a mustard paste, or a flaxseed poultice over the chest and throat, or rub on camphorated oil, or turpentine and oil in equal parts. (This treatment must be stopped before the skin is too much irritated.) Give a light but nourishing diet. Care is needed to build up the system afterwards to prevent a repetition of the same condition.

COTARNINE

See STYPTICIN.

COUGHS AND COLDS

Prevention of coughs and colds

One of the best precautions against taking cold is the plentiful use of cold water. A good plunge bath every morning, or at least sponging the throat, arms, and chest with cold water for a few moments, will cause the blood to circulate freely and brace up the system. Breathing through the nose instead of the mouth, when in the open air, will often prevent sore throat. Damp skirts and wet shoes should be changed immediately, and if the feet are cold and wet, dip them into cold water for a minute, and rub briskly with a rough towel. The passages of the nose and throat should be kept thoroughly cleared so that the air can circulate freely through them, and thus prevent any clogging that might cause catarrh.

Care of coughs and colds.—Once the symptoms of a cold really establish themselves, there are some simple remedies that can be tried to overcome it. The first thing which

COUGHING

all doctors recommend is a good cathartic to clear out the system and reduce the feverish symptoms. This is always best taken at night so as to act the first thing in the morning. Almost every one has some simple home remedy he is accustomed to use, and it should be followed in the morning by a Seidlitz powder or one of the many mineral waters in general use. With children a dose of castor oil is the safest and best remedy to use, especially when there is any sign of croup. As a rule, calomel acts well with adults, in overcoming a cold; either in doses of one-tenth of a grain tablets, two taken every fifteen minutes until ten or twelve have been consumed; or one-quarter grain tablets, one every half hour for four doses. Calomel should always be followed in a few hours by a mineral water or salts of some kind to prevent its remaining in the system.

When there are any feverish symptoms with the cold, as headache, flushed cheeks, skin dry and hot, etc., a hot mustard foot-bath will draw the fever down from the head and promote free perspiration. After the foot-bath, tuck your patient in bed with hot water bags and give him a hot drink of any kind, heat being the principal object; either milk, bouillon, or lemonade. In the morning a cold sponge over arms and chest, and a generous dose of mineral water, will often be the final touch necessary to drive the cold out of the system. Camphor taken in some form at the very beginning of a cold is most helpful; it can either be taken in camphor pills, in the rhinitis tablets which contain a good deal of camphor, or spirits of camphor, ten drops on a lump of sugar.

Five or six grains of quinine, taken at bedtime, and again in the morning, is also of great service in some cases in the commencement of a cold.

COUGHING

Coughing is a violent expiration preceded by a deep inspiration. When a patient coughs, there is a deep inspiration at first, followed by violent contractions of the abdominal muscles, which push the abdominal organs up against the diaphragm. The diaphragm then presses up against the lungs, and violently expels the air and secretions which they contain. The expiration is violent, because the larynx is closed at the time when the expiration occurs.

Coughing is a reflex act. It occurs when an object lodges in the larynx, when the bronchi are red and inflamed, or when they contain a great deal of mucus. These affect the nerve endings in the bronchi, which send impulses along the vagus nerves to the respiratory center in the medulla.

COUNTERIRRITANTS

This center at once sends back impulses to cause violent expiratory contractions of the diaphragm, and coughing results.

COUNTERIRRITANTS

The Meaning of Counterirritant.—Counterirritants are “remedies which by irritation of the skin are intended to counter or check deeper-lying affections.”

The counterirritants used to produce varying degrees of irritation are:

1. *Rubefacients*.—These are agents used to produce the first degree of irritation which, as the name implies, means irritation sufficient to cause reddening of the skin. The agents used are:

(a) Physical agents which may be local or general applications of heat applied for a brief or prolonged period.

Local applications of dry heat may be in the form of a hot-water bag, baking, electric light and the cautery.

Local applications of moist heat may be in the form of poultices, compresses, stupes, a hot foot-bath, an arm-bath, a sitz bath, and irrigations.

General applications of dry heat may be in the form of a hot-air bath or an electric bath.

General applications of moist heat may be in the form of vapor baths, hot packs or hot tub-baths.

(b) Mechanical agents, such as friction, percussion, pressure, or suction.

(c) Chemical agents, such as mustard, turpentine, or iodine, etc.

2. *Vesicants* are the agents used to produce the second degree of irritation, which, as the name implies, means the formation of a vesicle or blister. An example of a vesicant is the cantharides plaster.

3. *Escharotics* are the agents used to produce the third degree of irritation which, as the name implies, means the formation of an eschar, which is a slough or the actual death of tissue. Examples would be strong acids or alkalies, copper sulphate, silver nitrate, or the cautery.

CRABS

See LICE.

CREOLIN

Creolin is an emulsion of cresol. It is used in 1 to 5 per cent. solutions to disinfect sinks, excreta, toilets, etc. It is also used in $\frac{1}{2}$ to 1 per cent. solutions for vaginal douches, and for bladder irrigations. Creolin solutions must be made up with warm water.

CRETINISM

CREOSOTE

Creosote is a substance made by distilling wood tar. Its action is due to the guaiacol which it contains.

The action of creosote is similar to that of carbolic acid; it is not as strong an antiseptic as carbolic acid, but it is more poisonous. It produces the following effects:

1. Locally, it relieves pain and acts as an antiseptic.
2. When given internally, it acts as an intestinal antiseptic.
3. It is absorbed from the intestines and it then lowers temperature, increases the perspiration and all the secretions, especially the bronchial sections.
4. It is eliminated by the lungs and urine. It acts as an antiseptic in both of these organs.

Creosote is used principally as an antiseptic in pulmonary tuberculosis or lung abscesses; to destroy the bacteria in the lungs. It is often given by inhalation.

Preparations

Creosote; dose 1 to 5 minims.

Creosote Water (Aqua Creosoti); dose 30 minims to 2 drams.

This contains 1 per cent. of creosote.

Creosote Carbonate (Creosotal); dose 5 to 30 grains.

See GUIACOL, and CARBOLIC ACID.

CRESOLS

There are a number of oily substances which are extensively used as antiseptics, and are chemically closely related to carbolic acid.

They are oily solutions, which do not dissolve readily in water and are used as emulsions or in soapy solutions. The antiseptic, physiological and poisonous actions of all of them are like those of carbolic acid.

Preparations

Cresol; dose 1 minim.

This is a mixture of cresols.

Compound Solution of Cresol (Liquor Cresolis Compositus). This is a 50 per cent. solution of cresol in soap solution. It is used in dilute solutions as a disinfectant.

Tricresol. This is a mixture of cresols.

Kresamine. This contains 25 per cent. of tricresol and is used as an antiseptic like phenol and as an ointment for skin diseases. See CARBOLIC ACID.

CRETINISM

See THYROID GLAND, DISEASES OF.

CROTON CHLORAL HYDRATE

CROTON CHLORAL HYDRATE, OR BUTYL CHLORAL HYDRATE

This resembles chloral in its effects; it is not as efficient but the effects are more lasting. It particularly lessens the sensations carried from the face by branches of the fifth cranial nerve. It is therefore frequently used to relieve the intense pain of trifacial neuralgia ("tic douloureux"). Dose, 5 to 20 grains. See **CHLORAL HYDRATE**.

CROTON OIL (OLEUM TIGLII)

Croton oil is a fixed oil; its active principle is an acid, crotonoleic acid.

Croton oil acts principally on the small intestine; producing in one or two hours after it is given, frequent large fluid stools with severe griping pains. The violent movements of the bowels continue for about twelve to fifteen hours, and each stool is accompanied by severe griping, so that the patient soon becomes exhausted.

The dose of **Croton Oil (Oleum Tiglii)** is 1 to 2 minims.

Administration

Croton oil is given principally in cases where the patient is unable, or unwilling to swallow. In cases of apoplexy, for instance, when the patient is unconscious; or in an attack of mania, when the patient is so excited that he is unwilling to swallow medicine.

In such cases, one or two drops of croton oil dissolved in glycerin or olive oil, are placed on the back of the tongue with a spoon. The oil may also be given on a piece of sugar, or on a few bread crumbs.

Croton oil is occasionally applied to the skin, to produce redness, and thereby to relieve congestion of deeper organs. A few drops of croton oil are poured on a piece of flannel, and rubbed on the skin. It may also be added to olive oil, or to a liniment, and applied by rubbing on the skin.

CROUP

Croup is a contraction of the muscles at the entrance to the trachea from the throat.

Symptoms: The chief symptoms are a noisy, "croupy" cough, difficulty of drawing air into the windpipe and straining for breath.

There are two distinct sorts of croup; one is the ordinary catarrhal croup and the other a membranous croup and very serious. The initial symptom—difficulty in breathing—is the same in both. Fortunately the latter is comparatively rare, but if a child shows symptoms of croup look in the throat immediately and see if there is any sign of mem-

CRY

brane forming there. If so, report it to the physician at once.

Treatment: Give an emetic of a teaspoonful of syrup of ipecac, a little alum on sugar, or one teaspoonful of melted vaselin. The finger can be put down the throat to induce vomiting. Place hot, moist cloths around the neck and down the middle of the chest, keeping a warm hot water bottle over them, or a flaxseed poultice can be applied there.

Hot, moist air to breathe relaxes the muscles and may be provided by the following methods:

1. Place a screen around the crib and cover the crib and screen with a sheet. If there is a croup kettle (this is a kettle with a long funnel spout) use this over some heating apparatus (alcohol or gas lamp) near the bed, being careful to avoid the danger of fire. Let the steam escape through the funnel under the sheet into the enclosed space. Lacking a croup kettle, use an ordinary kettle with a paper funnel or a child's bugle attached to the spout.

2. Take the child to the bathroom and turn on the hot water so that the resulting steam may be breathed.

3. Or take the child to the kitchen where a temporary bed may be made on a table or chairs near the stove, with an umbrella and sheet over it to provide an enclosed space. Have the steam from the kettle directed into this space by means of an improvised paper funnel.

A mustard foot-bath is sometimes very effective.

Be careful in giving the treatments outlined above that the child does not take cold as the effort of difficult breathing causes excessive perspiration. Afterwards give a laxative. The diet for the next few days should be very light.

CRUTCHES

See AMPUTATIONS.

CRY

Significance of a child's cry.

Crying immediately after coughing shows that the cough has caused pain in the chest.

Incessant crying in a very young child is a sure indication of pain or hunger. If from hunger, the child will stop crying as soon as he is fed.

When there is pain in the ear the child will frequently put up his hand to his ear.

When there is pain in the abdomen the cry will be very loud, and the child will draw his legs up against the abdomen.

CUBEBS

Sharp screams at intervals, followed by low moans, may be a sign of brain disease.

CUBEBS

A powder made from the unripe fruit of the **Piper Cubeba**, an East Indian Plant.

The action is the same as that of *Copaiba*.

Preparations

Fluidextract of Cubebs; dose 10 to 30 minims.

Oleoresin of Cubebs; dose 10 to 15 minims.

Oil of Cubebs; dose 5 to 15 minims.

See COPAIBA.

CUMULATIVE ACTION

Some drugs are excreted much more slowly than they are absorbed. If such drugs are administered for any length of time, a part of each dose always remains in the body. After prolonged administration so much of the drug may accumulate in the body that poisonous effects may occur. The poisonous effects that result from a drug accumulating in the body as a result of the elimination being slower than the absorption are called **cumulative effects**.

Drugs which are apt to cause cumulative effects when given continuously, should be administered with periods of intermission during which the drug is stopped, or the dose should be gradually reduced. For example, digitalis, which may cause cumulative effects, should be given in diminishing doses or with periods of intermission when it is discontinued entirely.

CUPPING

Dry cupping is a means of producing a counterirritant effect, through suction, by the application to the skin of specially made cups (Biers'), or small glasses in which a vacuum is created by heating the air contained in them. When the air is heated it expands and part of it escapes—at this point the glass is placed on the skin. As the air cools it condenses, so that a partial vacuum forms in the glass into which the tissues beneath are drawn. These tissues are thus expanded, their blood vessels are dilated so that an increased amount of blood flows through them. In this way the circulation is stimulated and congestion relieved in the deeper tissues. The Biers' cups are glasses of various shapes, provided either with a rubber bulb by which air may be exhausted, or fitted with a valve or stopcock to which a small exhaust pump may be attached to exhaust the air in the glass.

CUPPING

Conditions and Purposes for which Cupping is Used:

Cupping may be applied to the following areas:

1. To the chest, either posterior, anterior or both, in asthma, edema of the lungs, or pneumonia with cyanosis in order to relieve pain, dyspnea and congestion or stasis of blood.

2. To the lumbar region to relieve congestion or stasis in the kidney and to relieve suppression.

3. To inflamed areas such as boils, etc., in order to stimulate the circulation in the part and cause an active hyperemia.

Cupping is contraindicated in acute pleurisy or peritonitis on account of the danger of injuring the parietal serous membranes.

Method of Procedure.—*Preparation of the patient.*—It is particularly important that this treatment should be performed as quietly, reassuringly, and as skilfully as possible. The thought of being burned is always an alarming one, so that, if the patient is conscious or not so depressed or toxic as to be indifferent to what is being done, he should be reassured on this point and also assured of the relief and comfort which usually result.

Only the necessary area should be exposed and every precaution taken to prevent chilling, especially of the arms and shoulders when cupping the chest. The feet and body should always be warm.

As the patient is frequently in a very serious condition, he should be disturbed as little as possible, and all exertion on his part avoided.

When he is not allowed to sit up and can breathe only when lying on his side, he is very carefully turned from side to side for the application. In either case watch his color, pulse and respiration closely.

The necessary *articles* are usually brought to the bedside on a tray. They consist of six or eight cupping glasses, an alcohol lamp, matches, absorbent cotton, a glass rod, alcohol, a glass to contain the alcohol, a piece of old blanket to extinguish the flame and two towels. One or two blankets will be required. The cupping glasses should have thick, smooth rims and should be clean and dry. They are placed conveniently on a folded towel (to avoid noise) on the side of the table near the patient. The articles on the tray are arranged conveniently and so that the lighted swab will not pass over the open glass containing the alcohol. This glass should be distinct in shape from the cupping glasses.

The greatest care must be taken to avoid burning the patient or setting fire to the bedding, etc. While such a calamity might never occur, the results are so serious and

CURARA

at least so alarming, that it is necessary to take the following precautions:

(1) Have blankets so disposed around the immediate area that no cotton or linen is exposed to the danger of fire.

(2) In placing the articles on the tray, the alcohol should be in the farthest corner from the patient, and away from the lamp.

(3) The cotton which is wound around the applicator or glass rod must be thoroughly moistened with alcohol so that the flame is due to burning alcohol, and not to cotton, shreds of which would be apt to fall and burn the patient.

(4) Avoid using too much alcohol so that it drops or runs along the rod, spreading the flame.

(5) Never use the cotton if charred.

(6) Don't have too large a flame as this will heat the rims of the glasses. Don't heat the rims, heat the air inside. There is no danger of burning if the flame is inside the glass, not around the rim.

(7) The glasses should be clean.

In applying the cups never leave small areas untreated and thus exposed to chilling. The vessels of the whole area should be evenly dilated. The cups, however, must not be applied where a former cup has made a deep mark.

The *duration* of the treatment is ordered and is usually from ten to twenty minutes, during which repeated applications are made until the desired result is obtained. In removing a glass, always insert your finger to allow the escape of air so that it may be removed without discomfort to the patient. Reddening of the part indicates the desired result has been obtained. Never allow the part to become a dusty red.

CURARA

Curara is an arrow poison which is used by the South American Indians. It is made from the bark of various trees, such as the **Strychnos toxifera**. Its active principle is an alkaloid, **curarine**. It is rarely used in practical medicine, but it is frequently used in animal experiments.

Curara paralyzes the nerve endings of all the muscles, thereby lessening their contractions. It causes a rapid, weak pulse, by making the heart beat faster as a result of the paralyzed nerve endings of the vagus nerve in the heart, which curara causes. The blood pressure is lowered, however.

It increases peristalsis and all the secretions. Curara is occasionally used to lessen the spasms of tetanus, hydrophobia, etc., but its use is dangerous on account of its weakening action on the heart. It is given in doses of $\frac{1}{2}$ of

CYSTS

a grain; or curarine, the alkaloid, is given in doses of $\frac{1}{200}$ to $\frac{1}{100}$ of grain.

CURETTAGE

See UTERUS.

CUSO

Cusso, kousso or brayera, is the female flowers of **Hagenia abyssinica** or **Brayera anthelmintica**, an Abyssinian tree. Its active principle is a neutral resin, **kosotoxin**, but it also contains tannic acid, a volatile oil and other substances.

Cusso has a bitter taste and contracts mucous membranes. Its principal effect is to destroy tape worms.

Large doses occasionally cause nausea, vomiting, diarrhea and rarely, collapse with an irregular pulse.

Preparations

Cusso is usually given in doses of half an ounce of the powdered flowers in water as a suspension.

Fluidextract of Cusso; dose 1 to 4 drams.

No cathartic is required after cusso, though the usual preparatory methods should be carried out.

See ANTHELMINTICS.

CYANOSIS

Cyanosis is a blue color of the skin. This is caused by the dark color of the blood in the superficial blood vessels. This dark color is due to the methemoglobin which the blood contains, as a result of an excess of carbon dioxide. It usually results when the patient does not get enough oxygen into the lungs to purify the blood.

CYCLOFORM

See ANESTHESIA.

CYPRIPEDIUM

Cypripedium is obtained from the roots and underground stems of **Cypripedium pubescens** or lady's-slipper, and from **Cypripedium parviflorum** or moccasin plant, two American plants. The active principle of these plants is a volatile oil.

It relieves nervousness and quiets the patient. It has been used as a substitute for valerian. Dose, of the fluid-extract, 15 to 30 minims.

CYSTITIS

See BLADDER IRRIGATION, and BLADDER INSTILLATION.

CYSTS

See OVARY.

D

DAKIN'S SOLUTION

Dakin's Solution is a specially prepared solution of sodium hypochlorite, containing exactly 0.45 to 0.50 per cent. of sodium hypochlorite. If the percentage of hypochlorite is less, the solution is inactive; if it contains more, the solution is very irritating. The solution must be absolutely neutral in reaction when tested with phenol-phthalein.

Action. Dakin's Solution is one of the best antiseptics now in use. Its antiseptic power is about fifteen times that of carbolic acid; yet it does not injure the young growing tissue cells, and consequently it does not retard healing as do most other antiseptics.

Carrel-Dakin Method of Treatment of Wounds

A fresh, exactly neutral solution is allowed to flow into the wound by means of a specially constructed apparatus. This apparatus consists of a graduated bottle and a long tube which terminates in a number of fine rubber tubes with small holes in their sides. These terminal tubes are placed in the wound in such a position that the fluid runs downward but in contact with every part of the wound, after being wrapped around with small pieces of gauze so as to keep them in place. Small pieces of gauze are placed between the tubes. About every two hours enough fluid is allowed to run through the tubes to just fill the wound. This intermittent flow is essential because the solution is absorbed by the tissues and new fluid is then required.

Dakin's solution dissolves the clots and dead tissue in the wound. It is therefore essential that all the blood vessels be tied before the treatment is begun; since the dissolving of a clot over an open blood vessel may cause a hemorrhage.

Since Dakin's solution is irritating to the skin the skin should be covered with sterile vaselin for protection. If the patient complains of pain, it means that the solution is flowing under too great pressure or that it has not been properly prepared.

DELUSIONS

DECOCTIONS

Decoctions are preparations of plant drugs made by boiling them in water and then straining the fluid.

DELIRIUM

Delirium is "a temporary general disturbance of consciousness, a perversion of the intellectual and perceptive faculties, characterized by confusion, by more or less transitory delusions and fleeting hallucinations, accompanied by disordered, senseless speech and muttering, and motor unrest." Delirium may vary in degree of severity from a mild wandering type in which the patient is incessantly engaged in disjointed conversation with imaginary persons or muttering to himself, with comparatively little motor activity, to an excited form characterized by extreme restlessness and violence, shouting and attempting to escape from bed or room and from the tormentors created by his imagination who annoy and harass him, or struggling with the imaginary enemies and those who try to limit his activity and prevent his escape. The mood is variable and may be happy, sad, anxious, apprehensive or fearful. Delirium may develop as a symptom in the infectious diseases and toxic conditions arising from disordered physical function, in alcoholic and drug poisoning, in conditions of exhaustion and senility, and following accidental injuries, trauma and surgical operations.

DELIRIUM TREMENS

See ALCOHOL.

DELUSIONS

Delusions are false beliefs which cannot be corrected by argument or experience. They may be improbable, impossible, inconsistent, absurd and fantastic, and are usually grouped as belonging to two types, the *depressive* and *expansive*. Among the *depressive delusions* are: Delusions of persecution, in which the patient believes himself to be the object of repeated acts of cruelty or annoyance; delusions of self-accusation in which he accuses himself of having committed some wrong or immoral act; delusions of reference in which he believes that everything which is transpiring about him is a direct allusion to himself; delusions of misfortune in which he believes that ill luck, calamity, disaster or accident have befallen him; and hypochondriacal delusions in which he believes that he is suffering from grave bodily disease. The *expansive delusions* include the "delusions of

DEMENTIA PRÆCOX

grandeur," in which the patient believes that he has great wealth, possessions, strength and influence. He may believe he owns all the banks, has billions of dollars, mansions of gold, a thousand automobiles, the beauty of Apollo, the strength of Samson, the authority of God and power to rule heaven and earth, for in fact there seems to be no limit to the extravagant expression. The opinion is held that these delusions represent in a florid form the unconscious desires of the patient.

DEMENTIA PRÆCOX

This is a term which is applied to "a group of mental disorders, occurring chiefly in youth or early adult life, showing a wide range of symptoms and leading to various degrees of mental deterioration which is exhibited mainly in the patient's conduct and emotional reactions."

Physical symptoms. The physical condition may be below normal, with loss of appetite, loss of weight, insomnia, anemia, fatiguability and cyanosis of the hands and feet. In many cases the physical symptoms are not present.

Mental symptoms. Orientation is not disturbed, memory shows no impairment and the general knowledge is well retained in the early stages. Hallucinations are common, and the attention may be so absorbed by them that little notice is given to what is happening in the environment. The stream of thought is gradually narrowed and ideas become scattered. Judgment is defective and delusions are common. The mood in the beginning may be despondent, but tends to become indifferent and apathetic, and experiences, both pleasurable and painful, fail to arouse the corresponding emotions. Disorders of conduct are shown by overactivity, impulsiveness, negativism, suggestibility, catalepsy, stereotypy and mannerisms.

There are four forms of dementia præcox usually described, but these cannot always be sharply differentiated from one another and all may show quite similar terminal stages: (1) Simple, (2) hebephrenic, (3) catatonic, (4) paranoid.

In the **simple form** the patient shows a loss of interest in the affairs of life, is inclined to be idle, careless of personal appearance, neglectful of the usual duties, and to spend the time in musing or day dreaming. Hallucinations and delusions do not occur in this form.

The **hebephrenic form** is characterized by silly, meaningless laughter without apparent cause, grimaces, peculiar attitudes, hallucinations of hearing and sight; the delusions are usually silly and fantastic and change often, are frequently of a religious and erotic nature, and may be of a

DEMENTIA PRÆCOX

depressed type and the patient will express ideas of self-destruction; thought is disconnected and ideas become few; unusual and peculiar words are used in peculiar settings, and speech may become monosyllabic or suppressed; the personal appearance becomes more untidy and bad habits are formed. The patient gradually becomes more listless and distinterested, tending more and more to withdraw from the world of reality and live in the fancied or dream world of his own creation, and mental weakness and dementia follow.

The catatonic form is characterized by disorders of conduct, muscular rigidity, resistiveness and negativistic tendencies, suggestibility shown by the maintenance of given positions and the repetitions of the words and movements of others, retention of saliva in the mouth, drooling, refusal of food, mutism and stupor where consciousness is clouded and all voluntary activity suspended. Periods of excitement may alternate with the stupor, during which the patient becomes very active, tossing about and shouting the same words over and over with no appreciation of their meaning. Sudden impulsive acts may also alternate with catalepsy.

The paranoid form is characterized by many hallucinations and delusions of persecution which are most improbable, impossible and absurd. The conduct may be assaultive because of the delusions.

Nursing procedures. When indicated measures should be taken to improve the physical condition, establish regularity in eating, bathing, elimination and all the usual activities, for in dementia præcox the habits are generally quite disorganized. The most important measure of treatment is to prevent and retard the deterioration which is always imminent and progressive unless it is checked by arousing the patient to new interests. Old and unwholesome habits must be broken up and discontinued, and new and healthful ones substituted. To do this requires kindness, patience and firmness in large measure. Begin by arousing an interest in the personal appearance and correcting errors in daily habits. Rest periods should not be permitted during the day, unless prescribed by the physician; and lounging about in slovenly attitudes; with the head covered and the body in cramped positions should be prevented. The tendency to hide in dark and unusual places, to be alone, should be combated by keeping the patient in a group. The patient must be guarded against himself, for vicious habits are so easily acquired.

If food is refused and all persuasive measures fail, the patient must be fed like any helpless patient, taking the usual methods to induce eating. If these measures fail, feeding by tube becomes necessary. Some patients of this

DEMENTIA PRÆCOX

group are tube fed for months, but always the effort should be persistently made to have them take food in the usual way. Bed treatment is usually prescribed for patients who have to be forcibly fed in order to conserve their strength. In the catatonic form the bladder and bowels are not as a rule emptied voluntarily and overdistention must be prevented. In this form, too, positions which are very uncomfortable and strained are maintained for long periods, and the nurse should keep this in mind and change the position often. Brisk rubbing after baths and massage should be given to quicken the circulation. Cyanosis of the hands and feet is not uncommon, and every least scratch or abrasion should be carefully treated, for these may lead to serious infections which are healed with difficulty. Sudden, impulsive acts are quite common and must be guarded against.

Occupations. As the tendency is strong to be idle and to dream, every effort should be put forth to arouse the patient's interest and keep him occupied. The attention is so absorbed by the hallucinations and delusions that details are scarcely noticed and all tasks are usually poorly executed; but by careful, patient, persistent supervision and training, improvement is made, and many of these patients become good workers. Because of inability to adapt themselves to new conditions, the work should not be abruptly changed, for they lose interest and refuse to work at all. It is better to allow them to keep on with the tasks they have learned to perform fairly well, and gradually to include the new work with the old until the change can be made without upsetting them too much. The daily care of one's room, sweeping, dusting, light cleaning, washing dishes and small personal articles and ironing them are some of the needful duties of housekeeping which they may assume under supervision.

For the **younger patients** of this group games have been found useful in training attention and arousing interest, for the instinct of play is usually strong. Games carried out to music are very good, for the patient must become one of a group and assume social relations with the group which afford good training in adaptability, and the rhythm of the music tends to make the responses more prompt. Gymnastics in small groups may also be encouraged, and good results may be expected, for these patients are suggestible and imitate well. Folk dancing is a most valuable means of exercise and recreation.

For the **men patients** of this group out-of-door occupation is desirable. Mowing and raking grass, sweeping walks, and simple gardening are tasks which may be performed by

DENTITION

even deteriorated cases and provide exercise as well as occupation. Tossing football, basketball and medicine ball will help to make the reactions more swift and exact. Gymnastic drills with wands and dumb bells will provide exercise and help to train attention. Other occupations should be provided to prevent idleness and unhealthy ruminations.

Reëducation includes all the measures which are taken to develop the latent capacities and to correct old and erroneous habits. This may assume the formality of a class with definite instruction in which the methods are simple, direct and attractive. The first steps with a group which shows deterioration may be to get them to stand in line, to march to music, to form a circle and join hands and move about to music, to run, to skip, etc. When these simple exercises are done with a fair degree of proficiency and accuracy, others which demand more attention and voluntary direction may be tried. These play movements may alternate with elementary instruction in which a simple, direct appeal is made to stimulate sensation, develop perception, gain attention and train memory. Self-expression should be encouraged and utilized and so develop out of what is already present other interests and responses which are sought for and desired in the treatment. Because these patients are inattentive to external impressions the stimulus must be strong, and something which can be seen and handled, blocks, squares, triangles, the blackboard, colored crayons, charts and models should be used. Attention can always be more readily gained when the proper sort of bodily attitude is assumed, and many times a given attitude promptly calls forth the desired response. Over and over the same ground must be covered, and over and over responses which are desirable must be emphasized and repeated. Through these lessons the patients are awakened from indifference and apathy and are taught habits of tidiness, orderly conduct and self-reliance, and gradually resume interest in what is going on around them.

DENTITION

There are two sets of teeth developed during life: the first temporary or deciduous; and the second, permanent.

Temporary teeth.—In the first set are twenty teeth, ten in each jaw: four incisors, two canines, and four molars. The cutting of the temporary teeth usually begins at six months and ends at about the age of two years. In nearly all cases the teeth of the lower jaw appear before the corresponding ones of the upper jaw.

DEODORANTS

TEMPORARY TEETH

	MOLARS CANINE INCISORS			INCISORS CANINE MOLARS		
Upper	2	1	2	2	1	2
Lower	2	1	2	2	1	2

The temporary teeth are usually cut in the following order:

Lower central incisors	6 to 9 months
Upper incisors	8 to 10 months
Lower lateral incisors and first molars	15 to 21 months
Canines	16 to 20 months
Second molars	20 to 24 months

Permanent teeth.—During childhood the temporary teeth are replaced by the permanent. In the second set are thirty-two permanent teeth, sixteen in each jaw. The first molar usually appears between five and seven years of age.

PERMANENT TEETH

	MOL.	BIC.	CAN.	INC.	INC.	CAN.	BIC.	MOL.
Upper . . .	3	2	1	2	2	1	2	3
Lower . . .	3	2	1	2	2	1	2	3

The permanent teeth appear at the following periods:

First molars	6½ years
Two middle incisors	7th year
Two lateral incisors	8th year
First bicuspid	9th year
Second bicuspid	10th year
Canines	11th to 12th year
Second molars	12th to 13th year
Third molars	17th to 21st year

DEODORANTS

Deodorants are remedies which destroy unpleasant odors. The chief deodorants are formaldehyde, chlorine gas, hydrogen dioxide, potassium permanganate, charcoal, lime, freshly roasted coffee, ferrous sulphate.

DERMATOL

See BISMUTH.

DERMOID CYSTS

See OVARY.

DIABETES MELLITUS

Diabetes is a disturbance of metabolism due to the partial or total inability of the tissues to burn carbohydrates. As the blood normally carries only 100 to 120 mgm. of sugar, to 100 c.c. of blood, or 0.07 to 0.11 or 0.1 per cent. of sugar,

DIABETES MELLITUS

when not burned the excess overflows into the urine. Diabetes is due to no fault or disease of the tissues, but to the absence of some agent which will combine with the sugar and make it available to the tissues. It is as though a match or spark were needed to ignite the sugar, just as coal or wood, etc., must be ignited before it will burn in the furnace. This agent, which is deficient or absent, is thought to be the internal secretion of the islands of Langerhans in the pancreas.

The Nursing Care and Treatment.—As the disease is incurable, the treatment is directed toward prolonging the life of the patient as many years as possible and providing the greatest degree of happiness, usefulness and comfort. The doctor prescribes the treatment, which the nurse must see is carried out with the most scrupulous care and intelligence. The nursing care is extremely important, for, the regulation, preparation, and serving of the diet, together with personal hygiene, are the great and all-important factors.

The **treatment**—restriction of the diet and normal habits of living—will depend somewhat on whether the patient is suffering from the disease in a mild, moderate, or severe form. This is determined by regulations in the diet, examinations of the urine and blood, and by the general symptoms and progress of the disease.

The Diet.—The life of the patient depends upon a proper regulation of the diet. Just as it is the province of the doctor, only, to prescribe drugs and other treatments, so it is the doctor, only, who should prescribe the diet for a diabetic patient. The nurse is there to see that, within the limits prescribed, the best selection is made; to avoid errors; to see that the food is properly prepared in the most digestible and acceptable form; for instance, while fat may be prescribed, foods fried in fat should never be given. She is there to see that the food is promptly and attractively served; to see that the restrictions and limitations cause as little distress as possible; that the tastes of the patient and variety are considered as far as the limitations permit; that the patient eats slowly and chews the food thoroughly; that the meals are as well balanced and resemble as nearly as possible the diet of a normal person for breakfast, dinner and supper, etc. She must also watch closely the effect of the diet on her patient.

In order to get the best results, to avoid errors, to gain the coöperation of the patient and to teach him how to plan and prepare his diet, the nurse must understand the following principles which guide the doctor in regulating the diet:

DIABETES MELLITUS

The *aim* is to make the urine sugar-free, to increase the carbohydrate tolerance, to prevent progressive loss of weight (except in obesity and overweight), and to do so without the appearance of the dreaded acid intoxication.

The body of a normal person has a limit to its ability to use glucose and tolerates it up to a certain point; beyond that it overflows into the urine. In diabetes this limit or tolerance for sugar and starches is more or less reduced according to the severity of the disease. It is most important to find out just what this tolerance is, that is, how much sugar or starches may be given without sugar appearing in the urine. The urine may be made sugar-free and the tolerance for carbohydrates may be increased by resting the pancreas, that is, resting the function of assimilation. This may be accomplished by restricting the total diet, or by cutting down the carbohydrate and protein, or by complete fasting until the urine is sugar-free. Each day the urine remains sugar-free increases the tolerance, whereas if the patient is untreated, the tolerance is lowered.

The sudden reduction of carbohydrates and protein or fasting may, however, lead to very serious results, that is, to acidosis and coma. For the body simply must have fuel. If it cannot utilize carbohydrates it will use fat as the next best fuel. But without carbohydrates fats cannot be completely burned, for "fats must be burned in the flame of carbohydrates." Incomplete burning of fatty acids causes acidosis, acidosis causes coma, and coma death. Acidosis is indicated by the presence of acetone, diacetic or β -oxybutyric acid in the urine and by other symptoms to be mentioned later. Protein is also a contributing factor in acidosis. In restricting the diet, therefore (usually in all, but particularly in the severe cases), fat is the first article cut down in order to avoid the possible danger of acidosis. When, by restrictions in the diet, the urine has become sugar-free, the next step is to find the carbohydrate tolerance by gradually increasing the daily amount, then the protein tolerance or both may be tested together. Last of all fat is added. Twenty-four-hour specimens of urine are daily examined for sugar, acetone, and diacetic acid. The blood is also examined for sugar because an increase in the blood-sugar may appear before sugar in the urine. The test is always made before breakfast because the blood-sugar rises after meals. These examinations determine whether the diet may be increased or not. It is one of the nurse's most important duties to see that no errors occur in the collection of specimens.

In building up a diet that the patient can tolerate, in addition to the amount of carbohydrate, protein and fat,

DIABETES MELLITUS

strict attention is given to the total number of calories. If too high it will cause sugar to appear in the urine. On the other hand, the body (according to the age and weight) even when quietly at rest in bed must have sufficient calories to carry on the activities which mean life and prevent progressive loss of weight. Even when the fat allowed is high and excess protein is given sufficient to supply material for building and repair and also for the production of energy, the total calories allowed may be pitiable small because of the great restriction in carbohydrates. In the diet of the normal individual more than half of the energy comes from carbohydrates.

CALORIES REQUIRED DURING TWENTY-FOUR HOURS BY AN ADULT WEIGHING ONE HUNDRED AND FIFTY-FOUR POUNDS

<i>Condition</i>	<i>Calories Per Pound, Body Weight</i>	<i>Total Calories</i>
At rest	11 to 14	1750 to 2100
At light work	16 to 18	2400 to 2800
At moderate work	18 to 20	2800 to 3150
At hard work	20 to 27	3150 to 4200

“Children require far more food than adults, because of growth and increased activity.”

THE CARBOHYDRATE, PROTEIN AND FAT IN THE DIET OF A MAN DOING MODERATE WORK, WEIGHT ONE HUNDRED AND FIFTY-FOUR POUNDS

<i>Food</i>	<i>Quantity Grams</i>	<i>Calories Per Gram</i>	<i>Total Calories</i>
Carbohydrate	400	4	1600
Protein	100	4	400
Fat	100	9	900

A nurse must therefore not only note the amount of the various foods in the diet and the effect upon the patient, but also the total calories in the diet, and see that the energy provided is conserved for the necessary body activities. For instance, when the diet is low calories must not be wasted by overexertion or exposure to cold; cold water or ice cream (even though made in accordance with the diet allowed) should not be given because calories would have to be used in warming them. Conservation of energy is particularly important in old people. For this reason, fasting is usually avoided.

Fluids.—Diabetic patients are always thirsty. They must have water to excrete the sugar, and in acidosis, the acids, in the urine. Water, tea, coffee and clear meat broths are the usual fluids allowed. Broths must be properly seasoned;

DIABETES MELLITUS

salt is good for diabetes. Hot drinks are always best because they avoid the loss of calories otherwise needed in warming them. (It must be remembered that the large amount of urine voided robs the body of heat.) Warm fluids are given during the period of fasting. It may be necessary to give increased amounts (if the amount of urine voided is less than normal) in order to remove acids and prevent acidosis.

Rest and Exercise.—Plenty of sleep and rest are essential in all cases. Overexertion and fatigue are to be avoided; fatigue raises the blood sugar. Exercise in some form, however, is always desirable. It keeps the muscles in good condition, improves the circulation, metabolism, mental attitude and general health. By exercising, the carbohydrate tolerance is often increased without sugar appearing in the urine. Out-door exercises and those which are enjoyable and diverting give the best results. Exercise should be moderate, with periods of rest following. The amount allowed depends upon the condition and the total calories in the diet. In severe cases overexertion may predispose to coma. Massage is valuable. The amount of exercise may be increased by training.

Mental Hygiene.—Quiet, freedom from worry, emotional strain, mental excitement, or fatigue are essential. Any nervous strain predisposes to coma. "It is dangerous to get angry." Arteriosclerosis is usually present in diabetes, particularly in the severe forms and greatly adds to the danger of nervous strain. Sleep and mental diversion such as reading, writing, games, conversation with friends and work which does not cause fatigue are valuable.

Care of the Skin.—It is extremely important to keep the skin in good condition, active, clean, warm, free from irritation, slight wounds, infections, bed-sores, or gangrene. It is apt to be dry and harsh due to loss of water in the urine. Its function is interfered with, metabolism in the tissues is poor and diabetics are very susceptible to infections such as boils and carbuncles, etc. Intolerable itching and eczema sometimes occur. The urine is irritating and may cause pruritus. Emaciation adds to the danger of bed-sores. Any break in the skin heals with great difficulty. It must be kept scrupulously clean by daily baths and its function stimulated by warmth, exercise, massage and by giving plenty of water to drink. Gangrene may be prevented by avoiding conditions which lead to arteriosclerosis, and by improving the circulation, especially of the extremities.

Care of the Mouth and Teeth is also most important. The mouth is usually dry; thirst is distressing. The tongue is

DIABETES MELLITUS

dry, red and glazed. The gums may be swollen. Stomatitis sometimes occurs. The teeth are often in poor condition, which increases the severity of the diabetes. The mouth always harbors germs and diabetics are very susceptible to infections and frequently die from complications such as tuberculosis, lobar or bronchopneumonia. The patient should never be exposed to infection, but particularly when on a low diet. Diabetes always grows worse with infection. A nurse with a cold should not take care of a patient with diabetes.

Symptoms to be Watched For and Reported.—*Symptoms of Coma.*—Patients who die of diabetes die in coma. Coma may usually be *prevented* if the early symptoms are noted and relieved. It is very difficult to *cure*. The onset may be favored by various factors which are therefore to be avoided. These may be an ether anesthesia, impaired function of the kidneys and failure to eliminate the fatty acids, constipation, mental excitement, infections, fatigue, exposure and chilling, overeating, fasting, sudden changes in the diet, improper regulation of the diet, such as cutting down the carbohydrates only, or a sudden increase in the fats with a low carbohydrate diet, for without carbohydrates fats cannot be burned.

The *Symptoms.*—*Dyspnea, diabetic air-hunger*, in which the breaths are deep and straining, is one of the most important. It is an effort of the body to get rid of carbon dioxide in order to lessen the acidity and keep the reaction of the blood normal. Other symptoms are loss of appetite, nausea, vomiting, headache, listlessness, drowsiness, weakness, vertigo, ringing in the ears, disturbance of vision, excitement or delirium. The *blood* will show an increased percentage of fat. The *urine* will show the presence of β -oxybutyric acid or diacetic acid or acetone.

The *treatment* consists in avoiding the conditions which predispose to or deepen the coma. Liquids are given freely by mouth, by rectum and sometimes intravenously. A solution of glucose is sometimes given by rectum to supply fuel and prevent the combustion of body fats. When given in this way it is slowly absorbed and oxidized so that the tissues can handle it more easily. Some doctors give a solution of bicarbonate of soda by rectum or intravenously to neutralize the acidity of the blood—other doctors consider this harmful.

Symptoms of Complications, which are apt to occur and from which the patient may die, should be recognized immediately. The most common complications are pneumonia, tuberculosis, nephritis, boils, carbuncles, abscesses, pruritus and gangrene.

DIACETIC ACID

Urine Tests in Diabetes.—A nurse may be required to examine the urine for sugar, acetone, or diacetic acid. The following simple tests may be used:

Tests for sugar.—1. *Fehling's Test.*—Put about 3 c.c. of urine in a test tube. Add about 5 c.c. of boiling Fehling's solution, then boil the mixture and place the tube in the rack. The formation of a typical red or golden yellow precipitate indicates the presence of sugar.

2. *Benedict's Test.*—Put 5 c.c. of the reagent and eight drops of urine in a test tube. Immerse the tube in a water bath of boiling water and keep the water boiling. At the end of exactly five minutes remove the tube and allow it to cool. If the fluid becomes opaque, it indicates that sugar is present. If no sugar is present the fluid remains clear or only a faint turbidity results due to urates.

These tests are based upon the fact that sugar is a reducing agent, that is, it will precipitate or separate heavy metals from their compounds. Fehling's solution, for instance, is a compound containing copper, which when precipitated gives the usual copper color to the solution. The Benedict test is a more sensitive one than Fehling's because the reagent is not reduced by uric acid, creatinin, and other substances which are in the urine, as Fehling's solution may be.

Test for Acetone.—Drop a crystal of sodium nitroprusside in 5 to 10 c.c. of water. Add 1 to 2 c.c. of this solution and a few drops of glacial acetic acid to 5 c.c. of urine and stratify strong ammonia over the mixture. A purple ring at the junction of the fluids indicates that acetone is present.

Test for Diacetic Acid.—Add a few drops of 10 per cent. ferric chloride to about 10 c.c. of urine, drop by drop. If a precipitate forms, filter and add a few more drops of ferric chloride. A "Burgundy" red indicates that diacetic acid is present. If the patient has been taking phenol, salicylates, aspirin, acetanilid or antipyrin, a dark color will also be produced on the addition of ferric chloride to the urine, but it will be a purple rather than a red as when due to diacetic acid.

DIACETIC ACID, TEST FOR

See DIABETES MELLITUS.

DIACHYLON

See LEAD.

DIAPHORETICS

Diaphoretics are drugs used principally to increase the secretion of sweat.

The most common ones are the following: Pilocarpus:

DICHLORAMINE T

ipeacac (especially in the form of Dover's powder); antimony; aconite; veratrum viride; spiritus *Ætheris nitrosi* (sweet spirits of niter); muscarine; eupatorium; and many of the saline diuretics, such as potassium citrate, solution of ammonium acetate, spirit of Mindererus. Most of the salicylic acid preparations also increase the perspiration.

DIARRHEA

Character.—Acute or chronic, accompanying many pathological conditions, especially in children in whom diarrhea in any form must be given immediate attention.

Causes.—Errors in diet, polluted water or milk, ptomaines, bad hygiene, and certain drugs.

Bowels.—The stools vary in number from three to twelve a day. They may be greenish yellow in color, containing mucus and particles of undigested food and, in prolonged cases, blood.

Treatment.—Rest in bed and total abstinence from food for from twenty-four to forty-eight hours. Salines are usually given by mouth or by rectum, but this is left to the discretion of the physician. Very little water is given by mouth during the period of total abstinence. Thirst is relieved by bits of ice, and enemas are given if necessary.

Administration of Diet.—When acute symptoms have disappeared and the stools are becoming more normal in character and number, a fluid diet of from four to six ounces is administered every three or four hours or oftener if patient is very weak. Brandy may likewise be given in cases in which exhaustion is marked.

Dietetic Treatment.—Concentrated foods of the simplest character and only those known to agree. Proprietary infant or invalid foods, except malted foods, which exert a laxative effect; among those found to be good may be mentioned Mellin's Food, Imperial Granum, and Racahout.

Foods to Be Avoided.—Fatty foods; pork, veal, and shellfish; all foods that are subject to fermentation in the stomach or intestinal tract (sugar).

Foods to Be Limited.—Fluids, soup, beverages, etc., because they impose more work on the intestines.

DICHLORAMINE T

This is an organic chlorine compound prepared by Dakin. It does not dissolve very readily in water. In wounds it is used in 10 or 15 per cent. solutions. It is used as a spray for the nose and throat and in wounds; usually dissolved in chlorcosane, or in chlorinated paraffin, or in chlorinated eucalyptol. (See DAKIN'S SOLUTION.)

DIETS

DIETS, SPECIAL

There are a number of diets formulated to meet the various normal and abnormal conditions. In hospitals these are classified as follows, for the convenience of both nurse and doctor:

House Diet.—That which is served to the hospital staff, the nurses, and those patients not requiring special diets.

Liquid or Fluid Diet.—Consisting of milk, nutrient and other palatable beverages, broths, and thin gruels.

Light, Semi-solid or Convalescent Diet.—Composed of thick or cream soups, eggs, toast, cereals, custards, jellies and ice cream, and later vegetable purées, broiled birds, chicken, lamb chops, and rare beefsteak.

Mixed Diet.—The diet used in normal conditions and for those not affected by any special food.

Special Diets.—Those designed to be used for certain pathological conditions, such as scarlet fever, nephritis, etc. These diets are classified as follows:

Milk Diet.—A diet in which milk is the sole article of food.

Carbohydrate-free Diet.—One in which the sugars and starches are eliminated.

Purin-free Diet.—One in which the foods rich in purin bases are eliminated. This is used in gout, arteriosclerosis, etc.

Salt-free Diet.—Diet in which sodium chloride (salt) is as far as possible excluded. It is used in certain cases of nephritis when edema is present.

Nephritic Diet.—A diet used in nephritis and diseases complicated by nephritis (scarlet fever). In this diet the protein foods, meat in particular, are restricted, milk being the exception.

Diabetic Diet.—A diet in which the carbohydrates are restricted or eliminated.

“**Allen Treatment of Diabetes**” consists chiefly of “starvation” for a given period and a reëducation of the organs to a toleration for carbohydrates.

Emaciation Diets.—Those containing a high percentage of fat-forming foods, such as milk, cream, eggs, cereals, potatoes, etc., olive oil.

Obesity Diets.—Those containing as few of the fat-forming foods as possible, such as cream, olive oil, potatoes, white bread, etc., pastry and desserts, candy and soda water, and containing lean meats, fish or shellfish cooked and served without butter or other fats, fresh or stewed fruit without sugar, green vegetables and salads served without oil or other fats; one egg a day two or three times a week, coffee

DIGITALIS

and tea without sugar or cream, toasted gluten bread (1 slice) without butter, saccharine substituted for sugar.

DIGITALIS

Digitalis is a drug obtained from the leaves of the **Digitalis purpurea**, or **Purple foxglove**, which grows in most temperate climates. The English leaves are the best.

The leaves of the second year's growth are mostly used in making digitalis preparations, because they contain the largest amount of the active principles.

The active principles of digitalis are the following three glucosides: **Digitoxin**, **Digitalin**, and **Digitalein**.

Digitoxin is the most potent of all, and is largely responsible for the digitalis effects.

Local Action: When injected hypodermically, digitalis is injurious to the tissues. It often causes inflammation and occasionally an abscess.

On mucous membranes: It causes pain, redness, profuse secretion of mucus, and often inflammation.

Internal Action.—In the mouth: Digitalis has a bitter and unpleasant taste.

In the stomach: Many of the preparations of digitalis cause nausea and vomiting.

In the intestines: Digitalis occasionally causes diarrhea.

Action after Absorption

Digitalis preparations are very slowly absorbed into the blood from the intestines. It usually takes about 12 to 36 hours for the effects of the drug to develop. If given hypodermically, it enters the blood sooner, and the effects appear more rapidly.

Since digitalis is so slowly absorbed, it produces prolonged effects. It is therefore the best drug to give to a patient suffering from chronic weakened heart action (myocardial insufficiency).

After absorption, digitalis affects principally the heart, the medulla of the brain and the kidneys.

Action on the Heart: Digitalis makes the heart beat slower and stronger, consequently the pulse becomes slower and stronger.

Effect on the Circulation.—With each prolonged period of rest or diastole the heart fills up with a larger quantity of blood. With each succeeding contraction or systole a large quantity of blood is pumped into the arteries and is kept circulating more freely. The blood itself is of better quality because the improved circulation in the lungs enables the red blood cells to take up more oxygen. As a result of the improved circulation, the various organs and

DIGITALIS

tissues of the body are constantly receiving more and better blood which improves their nourishment and enables them to perform their work better. Stagnation of blood in these organs is relieved. Accumulated fluid in the tissues (edema) is gradually removed.

The slow rate at which the improved action of the heart and circulation (including the circulation within the heart itself) occurs, prevents exhaustion of the heart muscle from overactivity.

Action on the brain: Digitalis affects only the medulla of the brain, especially that part of its gray matter which sends out impulses to slow the heart. In overdoses, it also sends out impulses for vomiting; and in such doses the impulses for motion may be increased so much that convulsions may result.

Action on the kidney: Digitalis increases the flow of urine very markedly; especially in cases where the tissues contain a great deal of fluid (edema).

Poisonous Effects

Since digitalis is slowly absorbed, and excreted still more slowly, it does not cause acute poisonous symptoms.

Cumulative Digitalis Poisoning

Cumulative digitalis poisoning frequently results from its continued administration. Whenever it is necessary to administer digitalis for a long time cumulative symptoms may be avoided by gradually reducing the frequency of the administration or by discontinuing the drug entirely, at intervals.

Symptoms.—1. Persistent nausea and vomiting.

2. Diarrhea.

3. Slow pulse; below 60, which may be irregular.

This is the most important symptom of digitalis poisoning and should always be reported to the physician. It means that a condition of heart block has been produced.

In severe cases, or from an overdose given intravenously, in addition to the sudden onset of the foregoing symptoms there may be **weakness, headache, disturbance of vision and dizziness**. On the slightest exertion the pulse may become very rapid (130 to 150), weak and irregular, the breathing becomes slow and deep and the urine may be scanty.

Treatment.—1. Stop the digitalis as soon as the pulse gets below 60 and is irregular. This is usually sufficient in most cases.

2. Keep the patient absolutely quiet.

3. Apply an ice bag or a hot water bag to the region of the heart.

DIGITALIS

4. Atropine and morphine are the drugs usually given to relieve the condition.

Administration

For rapid effect, as in collapse, only some of the newer unofficial preparations are given. They act more quickly than other preparations and can be given hypodermically.

All preparations of digitalis should be given in a wine-glassful of water slightly flavored. They should always be given between meals when the stomach contains little acid. The presence of large quantities of acid in the stomach lessens the absorption of digitalis preparations.

Digitalis preparations should be fresh and made from reliable English leaves. The failure to obtain results from digitalis is often due to unreliable preparations.

Myocardial Insufficiency is the only condition in which the nurse may observe striking effects from the use of digitalis. In the other conditions only its characteristic effect on the pulse may be observed.

Appearance of the Patient after Digitalis

When digitalis is given to patients suffering from failing compensation or myocardial insufficiency, all the symptoms disappear. Within a few days after its administration is begun, the patient breathes easier and the blue color of the skin disappears. The swelling of the extremities (edema) gradually becomes lessened until it completely disappears. The pulse is stronger and slower. More urine is passed and the nausea and vomiting disappear.

Preparations

Digitalis (Powdered leaves); dose $\frac{1}{2}$ to 2 grains.

Extract of Digitalis; dose $\frac{1}{8}$ to $\frac{1}{2}$ grain.

Infusion of Digitalis; dose 1 to 4 drams.

The usual official infusion is a 1.5 per cent. solution, or one part of digitalis to $66 \frac{2}{3}$ parts of water.

Many physicians order weaker infusions; such as 1 to 150, etc. The dose for such infusions is correspondingly greater.

Fluidextract of Digitalis; dose 1 to 2 minims.

Tincture of Digitalis; dose 5 to 15 minims.

This preparation keeps well and is perhaps the most reliable one.

The following preparations are not official. Many of them are used extensively and are very reliable. Some of them can be given hypodermically, because they do not form abscesses and produce effects rapidly.

Digalen; dose 10 to 30 minims.

Digalen is a solution containing digitoxin, the most active glucoside of digitalis. The digitoxin in this preparation has been prepared so that it may be easily dissolved. It

DILATATION OF STOMACH

is given hypodermically, and produces its effects in from one to two hours.

It is also given intravenously in doses of 5 to 15 minims producing effects in from 15 minutes to a half hour. It can be repeated intravenously in these doses about every half to one hour.

Digalen Tablets: Each tablet contains the same amount of digitoxin that is contained in 8 minims of digalen.

Digipuratum: Digipuratum is a preparation of digitalis from which many of the inactive substances have been removed. It contains no digitonin, and is therefore not apt to cause nausea and vomiting.

It is made from specially grown leaves, and the dose is regulated and accurate.

Digipuratum Tablets; dose $1\frac{1}{2}$ grains.

These tablets are given in the following way: one tablet four times a day, reducing the dose every day by one tablet, until ten tablets are taken. The digipuratum is then stopped. This allows the body to eliminate the drug which it has accumulated. Cumulative symptoms are thus avoided.

Digipuratum also comes in vials for hypodermic use. Each vial contains 1.0 c.c. of fluid, and is equivalent to $1\frac{1}{2}$ grains of digipuratum.

Digitoxin; dose $\frac{1}{250}$ of a grain.

This is not often used, as it cannot be dissolved easily.

Digitol; dose 5 to 15 minims.

DILATATION OF STOMACH

See STOMACH; and GASTRIC DILATATION.

DIPHTHERIA

The *cause* of diphtheria is the *bacillus diphtheriæ*.

The *incubation period* of pure diphtheria is short, being one to three days as a rule: the prodromal period is still shorter, one-half to one day generally, and presents nothing diagnostic; the typical symptom is the membrane, but it does not always develop in typical form: the fastigium is about a week in uncomplicated cases; and recovery from the acute symptoms is fairly prompt. Unfortunately, pure diphtheria is not often seen, most cases being complicated by the presence of a variety of other germs, of which staphylococci and streptococci, probably constitute the most usual and important. The natural history of pure diphtheria is now difficult of study partly because of the presence of other germs, but chiefly because antitoxin is almost universally used in all cases brought to a physician's attention. The descriptions handed down from pre-antitoxin days make diphtheria a horrible disease in which the patient choked to

DIPHTHERIA

death from overwhelming masses of membrane, or died later from the systemic poisoning. We see the latter now at times in neglected cases, but the former is rare, even in such cases.

The *complications* of diphtheria are peculiarly those of the poisoning effect of the absorbed poison on the nervous system, heart and kidneys.

Paralyses are common, especially slight paralyses affecting the soft palate and resulting in regurgitation of liquids through the nose when the attempt to drink is made; the voice, of course, is affected also. These paralyses may affect the limbs. Loss of knee-jerks is common. The most serious result is heart failure, which often terminates fatally cases which appear to be in other respects on the high road to recovery.

The *treatment* of diphtheria is, unlike the treatment of most of these infections, specific. We know the poison (diphtheria toxin); we know the substance (diphtheria antitoxin) capable of neutralizing it in the body. The patients who recover without artificial aid do so because they manufacture this antitoxin themselves in sufficient quantity to prevent the poison overwhelming them. The secondhand antitoxin, manufactured in the horse in advance and ready for artificial administration to the patient, accomplishes the same end, but can be given in enormous doses promptly, instead of awaiting its development at the mercy of the toxin versus the patient's own antitoxin-making power.

Early treatment with sufficient doses of antitoxin is the secret of success. Not less than 10,000 units should be given at the first dose, 20,000 if the patient is seen after the second day, 30,000 or more if seen first after the third day. These doses should be repeated in each case within eight hours unless marked improvement has occurred. In early cases intramuscular injection is indicated—into the buttocks or outer aspect of the thigh about its middle. In late or severe cases, intravenous injection is called for, because the intramuscularly-placed serum is absorbed more slowly. Subcutaneous injections should not be used, at any stage, for absorption is too slow, and the pain of inoculation is greater than in either of the other methods—an important item in children, especially since it is usually necessary to give another dose later. The immunity conferred by antitoxin is not lasting—two weeks at the most. Toxin-antitoxin mixtures give more permanent results.

In about ten per cent. of patients a rash will develop as the result of the injection, usually about a week later, and is often startling to those not familiar with serum treatment. It is due to the fact that *horse serum* has been used, not to

DIPHTHERIA ANTITOXIN

the antitoxin proper—normal horse serum will produce the same effect.

Anaphylactic shock may occur and is discussed elsewhere. Asthmatics and persons showing horse-sensitiveness, should not receive antitoxin unless in extreme necessity. It should be administered in such cases thus—one drop only should be injected; wait an hour; if no evil effects have occurred, give the rest; if they have occurred and the patient has survived, give the rest.

The heart of a diphtheria patient should be treated with the greatest consideration, whether the disease be mild or severe, whether the antitoxin treatment has been followed well or ill, whether the case is first seen early or late. This means, *rest in bed*, with an absolutely effortless régime for the patient, to last at least two weeks, better three, after the membrane is gone. Such patients should receive a standardized digitalis preparation from the moment the acute symptoms moderated, in order to provide such additional rest for the heart as may be thus possible.

See INFECTIOUS DISEASES, COURSE OF; PHARYNX.

DIPHTHERIA ANTITOXIN

See SERUMS.

DISINFECTION AND STERILIZATION

Sepsis means poison produced by putrefactive bacteria.

A **septic** wound is an infected wound.

Asepsis means freedom from infection.

Sterile means free from germs.

An **aseptic wound** or dressing is one free from germs, or sterile.

An **antiseptic** is an agent by whose means the growth of germs is prevented (but it does not kill them). In a wound antiseptics prevent putrefaction by virtue of their action in arresting the growth of organisms or the chemical activity of certain substances which give rise to fermentation and decomposition. They include carbolic acid, boracic acid, iodine, alcohol, balsam of Peru, and many others.

A **disinfectant** is an agent which kills germs. In a wound disinfectants destroy germs or active chemical substances on the surface already infected or foul. They are for the most part the same material as the antiseptics but are used in a much stronger form, as strong solution of carbolic acid, iodine, etc.

Deodorant is an agent used to destroy odor. The best deodorant is fresh air. Chemical deodorants absorb gases

DISINFECTION

and neutralize foul odors. Those chiefly used are charcoal, permanganate of potassium, etc.

Sterilization

The important point in modern methods of treating a wound is to have preparations made beforehand in order that all things used in such treatment may be perfectly free from germs, or as it is called, sterile.

Sterilization is a method of destroying germs with heat by such methods as:

Boiling temperature	212°
Steam pressure temperature	230°
Dry heat	300°

In hospitals and large sterilizing plants the heat is arranged in large sterilizers and the dressings, instruments, or any articles to be rendered sterile, are left in the sterilizer at a definite heat for the required length of time.

General disinfecting of utensils, instruments, dressings for wounds (cotton, gauze), fluids or lubricants, and clothes, is usually done by the process of sterilization, but chemicals are also used for this purpose. The latter, however, are used chiefly in **strong solution** for disinfecting the direct discharges that contain germs, or at a **weaker strength** as antiseptics. But their use and strength should be governed by the physician in charge.

Any sterile solutions of the strength required, dressings, gauze, cotton, instruments or utensils, are obtainable in sterile, sealed packages at a local drug store.

Practical suggestions for sterilization. In households where there are not likely to be any definite arrangements for such a purpose, sterilization may be most practically accomplished by first cleansing the article and then **boiling** it for the required time and using it undried when taken out of the water, unless there is a sterile substance to dry it on.

To make sterilization consistent and of any use, do not touch the sterilized article with the fingers, if possible to use a sterile instrument, such as forceps, or sterile scissors; and in any case, the part to come in direct contact with the body must not be made unsterile by careless handling.

To sterilize a dressing. To sterilize a dressing, place the gauze, cotton, linen or old muslin, folded in a convenient size, in an outside cloth and pin or tie together, and then boil for twenty minutes. Wring partially dry (while still in the outside cloth), then apply the inside dressing moist, taking care not to touch your own fingers to that part of the dressing which is to be applied to the wound.

DISINFECTION

To sterilize towels. To sterilize towels, wrap several together in an outside cloth and boil twenty minutes; wring out as described above and use the inside towels while they are wet.

To sterilize rubber. Gloves, bags, tubings, or any rubber utensil, may be boiled from two to five minutes. These may be wrapped in a cloth and removed from the water without touching, or they may be boiled directly in the water and removed with sterile forceps, without touching that part which will come in contact with the patient. Never use soda when boiling rubber as it softens it too much.

To sterilize instruments. Needles, scissors, forceps, nail files, etc., are sterilized by placing them in boiling water in which 1 per cent. of soda has been dissolved (this is to prevent rusting), and boil for five minutes.

For glass utensils, tips, nozzles, etc., place them in cold water, bring to a boil, and boil five minutes.

For larger utensils, place them in a large sauce pan or washing boiler and boil for ten minutes (active boiling).

To sterilize gauze or cotton. To sterilize gauze or cotton or the stoppers of babies' bottles, place them in a bottle with an airtight cover, surrounding this with cold water, (do not let the bottle come in direct contact with the bottom of the pan), and bring the water to a boil. Keep it boiling for an hour.

Fluids, oils, or tubes of vaseline can be treated in the same way and thus made sterile. Water can be sterilized by straining or filtering it and then boiling it, taking care that it is kept in a sterile receptacle.

Methods of Disinfecting

Disinfecting. Generally speaking, sterilization means the process of destroying germs by heat, while disinfecting usually implies the use of chemical agents. This latter method is especially used to destroy germs in direct discharges from the body. These chemicals are strong poisons and should only be used by the direct orders of the physician.

Stools, or movements from the intestines. Use the particular disinfectant in the strength ordered by the physician. Place as much of this as there is fecal matter in the vessel, stirring it thoroughly with an implement that can be boiled or destroyed (for instance a glass stick which can be easily boiled). Over this vessel place a cloth wrung out of the disinfectant and leave it from one to two hours. Then the stools can be safely disposed of in the usual way and the vessel rinsed and thoroughly washed with soap and water.

DISINFECTION

Urine. Place equal parts of urine and disinfectant together, leave for half an hour, and then dispose of in the usual way.

Vomited matter may be treated in this same manner.

Sputum should be disinfected when it contains germs from a diseased condition local to lungs, nose or throat. If it is possible have the patient use paper sputum cups and burn these intact. But if this is not practical, have the patient expectorate into a cup in which there is a little water (to prevent sputum drying and allowing the germs to escape into the air). At intervals of at least every six hours, mix the sputum that has collected in the cup with the ordered disinfectant. Leave it for an hour, covered, and then dispose of it in the usual way. If cloths are necessary to catch the sputum, substitute if possible paper napkins, or use old cloths which can be burned; otherwise these must be disinfected like any other receptacle, or boiled at once, as they contain the direct discharge.

Clothes should be **boiled** as this destroys the germs. They are usually kept in a weak solution of chemicals until a convenient time to boil them. The weak solution of chemicals only prevents the growth of the germs temporarily, while boiling directly kills them. If there is any discharge on the clothes they should be boiled at once.

Dishes. The simplest and surest way is to boil them for ten minutes. If this is not feasible, they may be left in the ordered solution of chemical disinfectant for half an hour and then washed with soap and water as usual. Those dishes coming in direct contact with the mouth, such as cup, glass, spoon, fork, etc., should be boiled.

Hands. Scrub the nails, hand and forearm thoroughly with a brush, soap and water for five minutes, then hold the hands in a chemical disinfectant as ordered for another five minutes. If no disinfectant is to be used after the washing, alcohol (from 50 per cent. to 70 per cent.) may be thoroughly rubbed into the hands. Dry the hands on a sterile towel, or shake them dry.

Chemical solutions. The chemical solutions most commonly used for direct application to the body are:

Salt, or saline solution, made by adding $1\frac{1}{2}$ teaspoonfuls or 90 grains of salt in 1 quart of water and boiling. This is chiefly used for washing out wounds, cavities, for all sorts of irrigations and douches, and is not irritating to the surface when applied in this strength; and

Boracic acid solution, made by adding 1 part of boric acid powder to 24 parts of boiled water, which equals a solution of 4 per cent. This is used in strength varying

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from 2 per cent. to 5 per cent. It is particularly non-irritating and is used for eyes, nasal sprays, irrigation for wounds, cavities, etc.

These two solutions while largely used on the body surface or in cavities are not strong enough to be effective as external disinfectants.

Alcohol, 95 per cent., or weaker (50 per cent. to 70 per cent.) may be used for external disinfecting of the skin or for disinfecting instruments or thermometers.

Milk of lime solution (1 part of slaked lime to 4 parts of water) is used for disinfecting discharges. Other chemicals sometimes ordered by a physician are:

Carbolic acid solution (2 per cent. to 5 per cent. strength)—6 drams or teaspoonfuls to 1 pint of water makes a 5 per cent. solution.

Bichloride of mercury— $1/1000$ to $1/5000$ strength— $7\frac{1}{2}$ grains of bichloride of mercury to 1 pint of water makes the strength of $1/1000$.

Formalin solution—4 per cent. to 10 per cent. strength. This comes in a 40 per cent. solution, 1 part of formalin to 9 parts of water makes the strength of 4 per cent.

Disinfecting a Room

In case it is necessary to disinfect a room after an illness of an infectious nature, it is fumigated and the infection destroyed by the gases of the chemicals used. This process is also used for cleansing rooms from insects, vermin, etc.

Preparation of room. Gather such things as books, toys, etc., that have been used by the patient, and if there is a stove or grate in the room burn them. Otherwise, have them taken to a furnace and destroyed after they have been fumigated with the rest of the room.

Open bureau drawers and closets and hang up pillows and blankets on a line and spread the mattress so that the air gets underneath it. Close windows and ventilators and cover fireplace. Close up all crevices around doors, etc., by strips of paper pasted over the openings (use simple flour paste which can be easily wiped off).

Method. Have water in a large dish pan or tray near the floor with a protector under it. **Formalin candles** are generally used for this purpose, placing three or four (for an average sized room) in this dish of water, supported on the tin stands that come with them. As there is no wick in them, hold a taper or candle to the edge until the ash begins to get white and fall away. This liberates the gas into the room and disinfects it. Moisture in room makes it more effective.

DISLOCATIONS

If sulphur is used, make the same arrangements, and place 4 or 5 lbs. of rock sulphur (for an average sized room) in a sauce pan, saturate with alcohol, and when this pan is placed in a larger one light the alcohol to start the sulphur burning. The door should be closed and securely sealed from the outside. Leave the room for twelve to twenty-four hours, then open the windows and thoroughly air and clean the room. Sulphur fumigating is frequently used for destroying vermin. Sulphur will destroy roaches but not ants.

When entering a room after it has been fumigated, to open the windows, hold a damp cloth to the mouth and nose to prevent the irritating effect of the gas on these parts.

DISLOCATIONS

A dislocation is the separation of the articular surfaces of two or more bones entering into the formation of a joint.

Symptoms.—There is first sickening or nauseating pain, greatly increased by motion of the part which causes pressure of the dislocated bone on nerves, etc. Deformity with a lengthening or shortening of the limb occurs depending upon the line of displacement. There is limited motion or loss of function in the part. After the reduction there is no tendency to a redisplacement as in a fracture. There may be swelling of the surrounding tissues. Some degree of shock is nearly always present.

Complications.—Injury to blood vessels, nerves and soft tissues, or contusions may occur. One or more bones may be fractured. The dislocation may be compound, that is, an external wound leads to the injured joint. A severe hemorrhage resulting in a hematoma sometimes occurs.

Treatment.—*First Aid.*—The limb should be put at rest in the position most comfortable for the patient. For a dislocation of the joints of the upper extremity—shoulder, elbow, or wrist—apply a splint or a bandage and support the arm in a sling. For a dislocation of the hip, knee, or ankle, the patient should be put to bed and a splint applied. To lessen the pain and swelling, ice compresses or the well-known lead and opium solution may be applied. Treat for shock if present.

The reduction of a dislocation requires both considerable knowledge and skill, and should never be attempted by an inexperienced person if it is at all possible to obtain the services of a surgeon, even after the lapse of many hours. Permanent injury may be done by improper manipulation. Frequently a general anesthetic is necessary to relax the muscles and relieve pain before reduction is possible.

DIURETICS

DIURETICS

Diuretics are drugs which increase the flow of urine. They may be divided into

1. Cell Stimulating Diuretics
2. Irritant Diuretics
3. Circulatory Diuretics
4. Saline Diuretics

Cell Stimulating Diuretics are drugs which increase the flow of urine by directly making the cells of the kidney secrete more urine from the blood, without injuring the cells themselves. The chief ones are: Caffeine and Theobroma.

Irritant Diuretics are drugs which increase the secretion of urine by irritating (injuring) the cells of the kidney and therefore making them secrete more urine from the blood. In large doses these substances may cause inflammation of the kidney. The chief ones are: Scoparius, Juniper, Uva Ursi, Chimaphila, Zea, Triticum, and Calomel.

Circulatory Diuretics are drugs which increase the secretion of urine by improving the circulation of the kidneys so that more fresh blood is constantly being brought to them from which to form urine. This effect may result from the action of a drug on the heart, as from digitalis. It may also result from widening (dilating) the blood vessels of the kidneys so that the blood flows more freely through them and more urine is therefore able to be formed. The nitrites increase the secretion of urine in this manner. The chief ones are: Digitalis, Strophanthus, Squill, Apocynum, Nitrites, Pituitary Extract, and Nitrates.

Saline Diuretics increase the secretion of urine in the following manner: Only the salts which are absorbed are able to increase the secretion of urine. When these salts enter the blood they increase its percentage of salt and the osmotic power of the blood is thus increased. As a result, fluid is withdrawn from the tissues into the blood until the blood becomes filled with an excess of fluid. This excessive fluid then passes from the small blood vessels of the kidneys into the tubules, at the glomeruli (where blood vessels and tubules meet), thus increasing the secretion of urine. The chief ones are: Potassium acetate, Potassium bitartrate, Potassium citrate, Sodium acetate and salts of Lithium and Strontium.

Several of the urinary antiseptics also act as diuretics: Urotropin, Methylene Blue, Buchu, Oil of Erigeron, Oil of Santal, Copaiba, Cubebs, Matico.

DIURETIN

See THEOBROMINE.

DOSAGE

DOBELL'S SOLUTION

See BORIC ACID.

DONOVAN'S SOLUTION

See ARSENIC.

DORMIOL

Dormiol or amylene chloral, is a colorless, oily fluid with an odor like that of camphor. It is a compound of amylene hydrate and chloral. It produces sleep in about half an hour after it is given, with no after-effects and it does not weaken the heart action. It is given principally to insane patients. Dose, 15 to 60 minims.

DOSAGE

Rule for Dosage

There is no rule whereby the doses of all drugs may be remembered. The dose of each drug must be memorized. The following rule, however, will facilitate the remembering of the principal preparations of the common potent drugs such as opium, nux vomica, belladonna, digitalis, etc.

The dose of the **crude** drug is 1 grain or 0.065 gm.

Fluidextracts represent 100 per cent. of drug, therefore the dose is the same as the crude drug, but in fluid measure: 1 minim or 0.065 gm.

Tinctures are 10 per cent. solutions; they are 1/10 as strong as the drug, therefore the dose is 10 times that of the crude drug but in fluid measure; of the potent drugs it is usually 10 minims or 0.6 c.c.

Extracts are concentrated solid preparations which are about 4 times as strong as the crude drug; therefore the dose is 1/4 as much as the crude drug; of the potent drugs it is usually 1/4 of a grain or 0.015 gm.

Conditions Influencing the Dose

Age: An older person usually requires a larger dose than a younger one. Old people and children, however, require smaller doses.

Young's rule for dosage is represented by the formula

$$\frac{x}{x + 12}$$
, in which x = age of the child. Thus a child of

4 years of age will require $\frac{x}{x + 12} = \frac{4}{4 + 12} = \frac{4}{16} = \frac{1}{4}$ of

an adult dose.

Sex: Males usually require larger doses than females.

Weight: Heavier, stouter individuals usually require larger doses than lighter ones.

DOUCHES

Temporary conditions: After a meal more absorption usually takes place, therefore the effects are usually more marked.

Time of Administration: Some substances produce better effects at different times. Thus drugs which produce sleep cause little effect in the morning and a better effect at night.

Pregnancy: In pregnancy potent remedies should be given in the smallest quantities, since they are apt to cause abortion.

Lactation: In the nursing woman care must be exercised in the doses of many remedies which are eliminated in the milk and which may therefore induce poisonous symptoms in the nursing child.

DOUCHES

A douche consists of a single or multiple column of water directed against some portion of the body.

Physiological effects.—By the application of the douche all the thermal effects due to applications of either heat or cold are hastened and intensified by the mechanical effects of the pressure or force and volume of water used.

The effects depend upon the following factors:

1. The *temperature* of the water used. This varies from 45° to 125° F.
2. The *pressure*, which varies from ten to sixty pounds.
3. The *duration* varies from three or four seconds to four or five minutes, depending upon the temperature, pressure and other factors in the application.

The neutral or sedative douche at a temperature of 92° F. and with very low pressure is sometimes prolonged to fifteen minutes.

4. The form of the stream is determined by the outlet. The horizontal, vertical, fan, or broken jets may be used. The form may be the shower, spray or needle bath applied to the surface of the body and irrigations to various cavities of the body such as the eye, ear, nose, throat, stomach, rectum, colon, bladder, vagina or uterus.

5. The area covered, which may be local or general.

6. The part of the body to receive the application, if local, as in the dorsal, lumbar and spinal douches.

Purposes of the douche:

The douche, either as a local or general application, may be used to produce tonic, stimulating, sedative or analgesic effects as desired.

It is *contraindicated* in acute inflammation, and in very nervous excitable patients where it is necessary to suppress reaction due to the application.

As the effects of the douche depend entirely upon the

DOUCHES

scientific regulation of the above-mentioned factors and as these factors can only be accurately administered by a highly trained person and by specially constructed apparatus, no attempt will be made here to discuss the various applications. A spinal douche, however, may be given fairly successfully either in the hospital or in a private home, and so may be prescribed by the doctor.

Spinal Douche

In the spinal douche a stream of water is moved rapidly up and down over an area covering the whole surface of the spine and extending three or four inches on either side of it.

The effects of the treatment vary according to the temperature, pressure and duration of the application: When special apparatus is not available it is difficult to obtain the exact temperature desired and impossible to secure the desired pressure. When desirable, friction may be used as a mechanical substitute for pressure.

A *tonic effect* may be obtained by a cold spinal douche. The temperature may vary from 45° to 78° or 80° F. The *duration* may be for three or four seconds.

A *sedative effect* may be obtained by a *tepid* (80 to 92° F.) or a neutral (92° to 97° F.) douche. The *duration* may be three or four minutes.

An *analgesic* effect may be obtained by a *hot* douche. The temperature varies from 104° to 125° F. The *duration* may be from one-half to four or five minutes.

The *temperature* should begin at 100° F. and gradually increase to the maximum. As a hot douche is usually given to relieve pain, a low pressure is always used and the stream must be rapidly moved from point to point to prevent burning. The high temperature mentioned may be used because the skin of the back is not as sensitive as in other parts of the body.

The Scotch Douche.—The spinal douche may be given in the form of a Scotch douche in which a single application of hot water is followed immediately by a single application of cold water. The hot douche lasts, from one to four minutes, and the cold douche from three to thirty seconds.

The *purpose* of the hot douche is to warm the part in order to intensify the effect of the cold, and to secure a better reaction. It also trains the patient to react to the cold douche and makes it feel grateful. The cold douche must follow the hot instantly as any lapse allows the wet surface to cool off rapidly by evaporation. The purpose of the hot application would then be lost.

The Alternate Douche.—When the spinal douche is given

DOUCHES

in this form, hot and cold applications are repeatedly applied in alternation. The duration of each application is usually about fifteen seconds.

Method of Procedure.—When the treatment is given to the patient in bed, the preparation of the patient and bed is the same as in a spray or slush bath. The patient should lie prone or on his side. Only the back should be exposed. A hot-water bottle may be placed at the feet, if necessary, as they must be warm. The body should also be warm. Friction may be applied before, during and after the treatment, if necessary, to obtain the reaction. Cold applications may be applied to the head.

When the patient is able to get out of bed, he is covered with a large sheet or bath blanket and is allowed to sit on a board placed across the foot of a bath tub. He may sit on a box or stool placed in the tub. This is especially advisable to avoid an accident and injury when the treatment is given for chorea in which the jerky, uncertain and uncontrollable movements of the patient make it impossible for him to sit without support. His back should be toward the faucets. The sheet or blanket is then draped so as to completely cover the body, leaving only the back exposed. The feet should rest on a stool or should be placed in a foot-tub of water at from 100 to 110° F. In a very hot douche this is necessary to prevent burning and in a cold douche to secure reaction.

To give the douche a spray is attached to the faucet and the stream is moved rapidly up and down over the prescribed area. When a hot douche is used great care must be taken to avoid burning the patient. A nurse should test the temperature of the water by directing it against her arm.

When the treatment is completed the care of the patient is the same as after a sponge or spray bath.

Vaginal Douche

Solutions used as douches are given for their antiseptic or constricting (astringent) effect on the mucous membrane of the vagina and cervix, and to remove accumulated secretions. Douches are also given to check bleeding from the uterus or cervix, and to lessen pain produced by their contraction. Contact with the diseased tissues is essential for the effect. It is especially important that every part of the vaginal fornix be irrigated to remove the secretions which usually accumulate in these regions.

For an antiseptic or an astringent effect, or for drainage, the temperature of the fluid should be that of the body, about 100° F. To check bleeding or to lessen pain, solutions should be as hot as the patient can stand.

DOVER'S POWDER

Articles Required

1. Sheet or bath blanket.
2. Warmed douche pan and cover.
3. Irrigation stand.
4. Douche tray, provided with:
 - (a) Douche can and tubing with stopcock or clamp (sterilized).
 - (b) Glass douche nozzle (sterilized).
 - (c) Bath thermometer (sterilized in carbolic or lysol solution, 10 per cent.—1-10).
 - (d) Jar of cotton pledgets or gauze.
 - (e) Paper bag.
 - (f) Bath towel or dressing towel.
 - (g) Bath blanket.
 - (h) Solution required—2 quarts or amount as ordered, temperature 105° to 110° F., or as ordered, solution to be in sterile pitcher or glass graduate.

Procedure

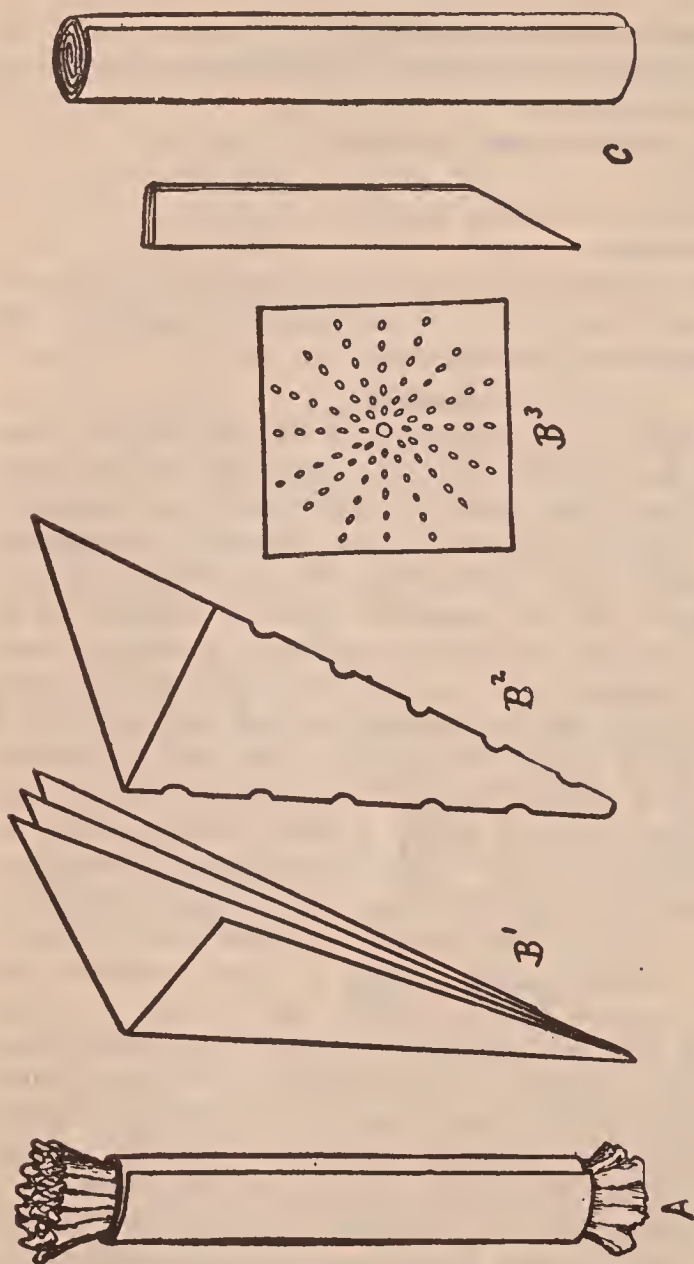
Patient on back, knees flexed, head on one pillow. Turn down upper bed clothes to foot of bed, but covering feet, cover patient with sheet or bath blanket as necessary for warmth, length crosswise of bed, draw up nightgown well above hips, place folded bath towel under buttocks. Make a reverse fold or twist of sheet or blanket as in giving an enema, see that chest and legs are well covered. Place folded dressing towel on shelf of pan, adjust under patient so that she will be comfortable and not strained; if necessary a small pillow or folded towel may be placed under back above douche pan. Pour solution into can and hang on irrigator stand at height so that lower part will be about 20 inches above bed. Return to dressing room, scrub hands thoroughly in hot running water, using plenty of soap, rinse well, do not dry except on sterile towel. Return to bedside. Adjust sterile nozzle to tube, examine for cracks, allow solution to run through into douche pan until tube is warm and air expelled. Douche vulva well, separate labia, douche vaginal outlet, being careful not to allow nozzle to touch labia. Insert nozzle in vagina in a downward and backward direction and while fluid is running turn nozzle gently round and round in order that every part of the cavity may be cleansed, hold tube while fluid is running. Remove tube before solution is completely exhausted, leave patient on pan for a few minutes, dry well around vulva with cotton or gauze, remove pan, dry back, bring up bed clothes, arrange pillows.

DOVER'S POWDER

See IPECAC; and OPIUM.

DRAINS

Cigarette Drain.—For this a piece of rubber dam or rubber tissue of suitable size will be used, and within it will be rolled, lengthwise, cigarette fashion, a piece of gauze of a size to fit the wound, the ends of the gauze being allowed to project slightly beyond the rubber (A of Fig.).



DRAINS. A, cigarette drain made of gauze rolled within a piece of rubber tissue or rubber dam; B¹, B², B³, three stages in the evolution of the Mikulicz drain which is made from a piece of gauze or rubber dam; C, rubber tissue or rubber dam drains made by folding the piece flat or by rolling it into a tube. (From Colp and Keller's *Textbook of Surgical Nursing*)

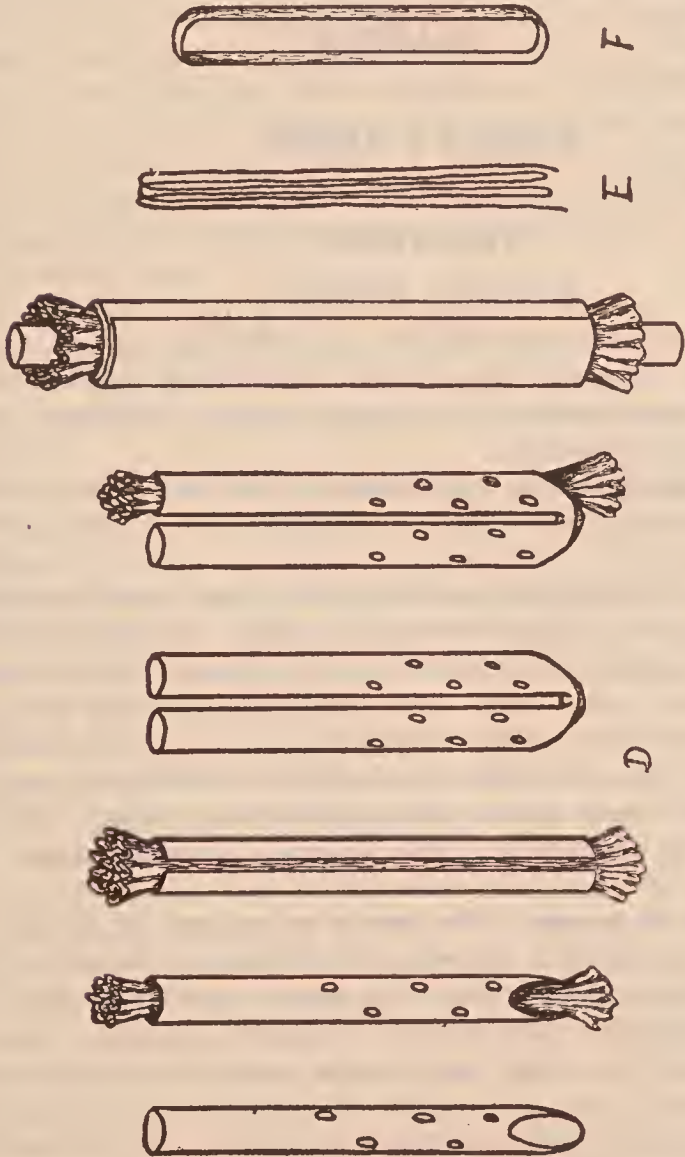
Mikulicz Drain.—A square piece of gauze or rubber dam large enough to line the entire wound is folded as indicated in B¹ of Fig.—that is, diagonally several times. With a pair of sharp, curved scissors small notches are cut in this folded piece of material as shown in B² of the illustration.

DRAINS

For insertion the drain will be unfolded, and after it has been perforated it should appear as shown in B³ of the illustration. When this is in place in the wound it will be packed full of gauze packing.

Rubber Tissue and Rubber Dam.—Pieces of either of these materials may be folded flat or rolled into tubes of suitable size (C of Fig.).

Rubber Tubing.—Pieces of rubber tubing may be fash-



DRAINS. (Continued.) D, various designs of rubber tubing drains; E, horsehair or silkworm gut drain; F, ordinary rubber band.
(From Colp and Keller's Textbook of Surgical Nursing)

ioned in various ways (D of Fig.). The gauze packing may or may not be used in these drains. The large drain of group D has the rubber tube inside of the gauze, and the whole is encased within a few layers of rubber dam.

Horsehair and Silkwormgut.—A strand may be rolled into a suitable shape for small wounds. (E of Fig.).

DRASTICS

Rubber Bands.—For small drains an ordinary rubber band, either whole or in part, may be used. (F of Fig.).

Gauze Packing.—This will need no special preparation.

A safety pin should accompany every drain, either to pin it fast to the dressing or to serve as a guard against its slipping into the wound and becoming lost.

A pair of dressing forceps is, of course, always among the general instruments, and this should always be in readiness for the insertion of the drain.

DRASTICS

See CATHARTICS.

DUNBAR'S SERUM

See POLLANTIN.

DYSENTERY

Entamebic Dysentery

This is a wide-spread disease of infectious origin characterized by frequent evacuations containing mucus and blood and accompanied by abdominal pain, tenesmus, and general bodily depression.

Cause: Predisposing: Anything which will lower bodily resistance, mainly unsanitary conditions and dietary indiscretions.

Exciting: The *Entamæba Histolytica*, a protozoal organism which invades the large intestine causing extensive ulceration. The organism is taken into the system through contaminated food and drink. All grades of severity are observed, ranging from the mildest degree of bowel derangement to the severest attack of dysentery, dependent on the location, the extent of the lesion, and the reaction of the patient to the infection. The disease is either *acute* or *chronic*.

Symptoms of Acute: The attack is ushered in by diffuse abdominal cramps and diarrhea of a watery nature. The character soon changes and the stools consist mainly of mucus and blood. Tenesmus is a marked feature. Severe toxemia shown by fever, rapid pulse and severe prostration often develops at an early stage. The temperature at the beginning is rarely high, but reaches 103° to 105° F. during the later stages. The abdominal wall is retracted and rigid, being sensitive to the touch especially in the right and left lower quadrant. In fatal cases, symptoms become progressively worse, resulting in death within a week. In cases which show a favorable outcome, a tendency to improvement becomes evident by the fourth or fifth day. The stools become less, but their dysenteric character may remain for

DYSENTERY

weeks. After recovery from an attack the encysted form of the organism often persists in the stool and the patient becomes a convalescent carrier of the infection and may or may not succumb to further attacks.

Symptoms of Chronic: This is by far the most common form. It is characterized by acute and subacute attacks with intervening periods of comparatively good health. Though not definitely ill, an impairment of bodily vigor is noticeable; there is depression, and the patient is easily fatigued; digestive disturbances and progressive loss of weight and loss of appetite are noticed. There may be nausea and vomiting and constipation; a moderate degree of anemia is present together with abdominal pain and soreness resembling appendicitis. There is a close relationship between ametic dysentery and abscess of the liver.

Treatment: Prophylactic: 1. Disinfection and sanitary disposal of feces.

2. Safeguarding of water supply.

3. Boiling all drinking water and milk when possibility of infection is present.

4. Avoiding raw fruit and raw vegetables grown in infected soil.

5. Destruction of flies and their breeding places.

Curative: The patient should be put to bed and not allowed to visit the toilet. No solid food should be given. Diet should consist of broths, strained soup, tea, whey, and albumin water. Milk is contraindicated during the early stages. Food should be given neither very hot nor very cold and in small quantities.

Hot, moist compresses to the abdomen will, to some extent, control the pain; if pain and tenesmus are severe, some opiate must be given. Morphine is best, and should be given in small doses ($\frac{1}{8}$ grain) and hyperdermically. For vomiting ice cloths to the back of the neck have been found efficacious. After stool, the patient should be bathed and the skin protected from irritation by vaselin or a dusting powder. The medical treatment consists of giving emetine hydrochloride 1 to 1½ grains, subcutaneously, or half a grain intravenously once a day; a larger dose is not safe as emetine is a depressant.

In chronic dysentery, ipecac root 5 grains in form of salol-coated pills is administered. The nurse should inspect the stools as these pills are often passed without being dissolved. This can be remedied by piercing the salol coating with a surgical needle. When ipecac is given, it is best to give it just before retiring, and the patient is urged to go right to sleep. No food should be taken for several hours before administration.

DYSENTERY

Bismuth Subnitrate, Magnesium Sulphate, and Chenopodium are also used. Irrigations of Quinine Sulphate, Silver Nitrate, and Potassium Permanganate solutions are useful but should not be used during ipecac treatment. The stools passed after a saline cathartic are best suited for microscopic examination for amebæ.

Bacillary Dysentery

This is an infectious disease of the intestinal tract, caused by one of the bacilli of the dysentery group, characterized by frequent stools containing blood and mucus and accompanied by pain and prostration. It occurs in all climates but is more common in the tropics. As with other enteric diseases, the infecting agent enters the mouth with contaminated food or drink. It passes into the stomach and small intestines where it begins to multiply. As the organisms increase in number, toxins are produced which are absorbed into the circulation. These toxins give rise to the dysenteric symptoms and the prostration.

Symptoms: The disease usually begins suddenly, often with rigors, headache, and vomiting. From the beginning there is great prostration. The temperature is slightly elevated, though it may go to 103° or 104° F. The pulse is rapid and small; the tongue is heavily coated and, as the disease progresses, shows the imprint of the teeth.

The characteristic symptoms are the frequent bloody stools and abdominal pain. The number of stools may reach 30 to 40 in twenty-four hours. The movements are small and consist exclusively of blood and mucus with not a trace of fecal matter. A single stool is often not more than a teaspoonful, and yet the patient complains of incessant desire to go to stool; the evacuations are extremely offensive. Vesical tenesmus is also frequently present, and the urine is scanty and high-colored. The patient complains bitterly of thirst; jaundice may appear. In severe cases death occurs in a few days; cases which recover, usually do so in 8 or 10 days; but the disease may become chronic and last for months or years.

In infants the character of the stool varies; blood is usually present either in small specks or streaks on the surface of the mucus mass or as fluid blood. Mucus is always present. As a rule the stools are green in color. Symptoms in chronic cases do not differ except in severity.

Treatment: Prophylactic: The patient should be isolated; the evacuations and bed linen should be disinfected; and contamination of food and water supply must be guarded against.

Curative: The patient should not be allowed to get up;

DYSPNEA

rest in bed is essential. The diet should consist of broths, strained gruels, barley, rice, and albumin water. Milk is not a suitable food during the height of the disease. The mouth should be kept clean. For the abdominal pain, hot fomentations or a hot water bag often gives relief. When the tenesmus is great, morphine $\frac{1}{8}$ grain may have to be given. After stool the patient should be bathed with soap and water and a dusting powder used to protect the skin surrounding the anus, and soft cotton used instead of paper. Prolapsed anus should be reduced with compresses moistened in warm salt solution. If vomiting is troublesome, nothing should be given by mouth, but fluid should be supplied by enemas or subcutaneously. Enemas of normal salt solution are stimulating and give the patient a few hours' rest. The medicinal treatment consists in early purgation; Magnesium Sulphate or Sodium Phosphate is best; they clear the colon of irritating matter, and, as the bacilli occur only in the intestines, they are carried away with the movements. The Magnesium Sulphate should be given in 2 dram doses every 2 hours until the stools lose their dysenteric character; then the dose is to be reduced and continued another day. Calomel may be used instead of the salts. After the character of the stool has changed, astringents are used, such as Bismuth Subnitrate 30 to 60 grains every 4 hours.

DYSMENORRHEA

See MENSTRUATION.

DYSPEPSIA

See STOMACH.

DYSPNEA

Dyspnea means difficult breathing. This condition resembles the "breathlessness" or being "out of breath" which we have all experienced from climbing several flights of stairs rapidly or from running a distance to "catch a car," but instead of being temporary and of short duration it continues hour after hour and day after day.

The respirations are almost always rapid and deeper and are usually accompanied by pain. Every breath is quick and labored, performed with great difficulty and only after a hard struggle so that the patient is exhausted with the prolonged effort. Dyspnea is caused by an increase of carbon dioxide and a decrease of oxygen in the blood resulting from incomplete metabolism.

The *symptoms* are rapid, labored breathing, with a distinct, audible sound; the lips are usually blue or a dusky

DYSPNEA

color; the face has a distressed, anxious expression; the eyes are prominent; unusual muscles are forced into action; the nostrils dilate; the upper part of the chest is greatly expanded by the action of muscles at the sides of the throat (the sternocleidomastoids) attached to the sternum, clavicle and mastoid bones; the diaphragm contracts with force and the abdominal walls protrude, so that each breath is drawn with "heavings" of the chest and abdomen. Frequently the dyspnea is so severe that the patient can only breathe when sitting up and so is obliged to sit up night and day. This condition is called *orthopnea*.

Dyspnea may affect inspiration or expiration or the whole act may be a struggle.

Inspiratory dyspnea is usually due to spasm or to obstruction in the air-passages, as in croup, edema of the glottis, diphtheria, and whooping cough. It gives rise to a very characteristic sound—high-pitched, crowing, harsh, and grating (stridulent breathing) as the whoop in whooping cough. In coma, apoplexy, or profound unconsciousness from any cause, each inspiration may be accompanied by a loud, snoring sound and the cheeks puff out at each breath. This is called stertorous breathing and is due to the vibrations of the relaxed soft palate.

Expiratory dyspnea occurs in asthma and in chronic bronchitis. In asthma the air seems to enter rather easily, but a spasmodic contraction of the bronchial muscles narrows the tubes so that expiration is painfully prolonged and "wheezing." In bronchitis the tubes are partially closed and contain secretions so that the sound is "wheezing" and the rattle of bubbles (air in fluid) may be heard all over. In diseases of the respiratory tract, near approaching death, when the fluid in the trachea and bronchi is abundant, this rattling, bubbling sound may be heard at a distance, and is spoken of as the "death-rattle." In pneumonia the breathing is shallow, difficult and painful, and each expiration is made with a characteristic "grunting" sound of discomfort. It is really a little moan from pain.

E

EAR NURSING

In the nursing of ear cases we are dealing more or less with pus infections, but this does not prohibit us from observing to the best of our ability a certain degree of technique.

Earache.—An earache should never be treated as a trivial matter; a few hours of neglect may result in serious complications. After a patient complains of an earache, the temperature should be taken and an immediate report made to the doctor. A few drops of hot saline and cotton can be put into the canal, but under no consideration should heat, ice bag, morphine, codeine or any of the coal tar products be administered, as local applications diminish the tenderness and relieve the pain without stopping the progress of the disease, masking the symptoms to a dangerous degree. Acute middle ear infections are promptly relieved as a rule by a myringotomy. The infection usually ceases and the patient recovers in from two days to two weeks.

Preparations for a Myringotomy: The patient's ear should be irrigated with a solution, temperature 110° F., and tray made ready with the following articles: Light, head mirror, 1 set of ear specula, myringotome, bayonet-forceps, scissors, cotton applicator, cotton alcohol, peroxide, Pomeroy syringe, glass bowl for irrigation, sterile towels, culture tubes and glass slides. Immediately after the operation the canal should be syringed with moderate force to prevent bloodclot from blocking the incision. Occasionally a moist gauze drain is introduced into the canal. It is hardly possible to give a definite line of symptoms for mastoiditis, as two cases are hardly ever alike.

Ear Douche: In the administering of an ear douche the necessary precautions should be taken as to temperature (110° F.), and height of douche bag 2 to 3 feet above the level of the patient's head.

Method of Holding the Auricle: The canal should be straightened by holding the auricle backward and downward

ECHOLALIA

in an infant, in adult upward and backward. Wipe out the canal with cotton and place a piece in the opening. Note the discharge on cotton at the next irrigation.

Mastoid Preparation: In the preparation of patients for mastoid operations there is a great difference of opinion amongst doctors, especially with female cases, as to the area which should be prepared. As this is many times of more importance to the patient than the operation it seems advisable to let the doctor decide about the preparation. If left to your own discretion do the usual preliminary preparation as to bath, enema, etc., and shave from $1\frac{1}{2}$ to 2 inches from the auricle, leaving a lock of hair in front on female patients. Cleanse the area shaved with a disinfectant solution and send to operating room where usually an iodine preparation, 3 per cent., is used. Omit dressing unless there is an open wound.

Mastoid Dressing Tray: Add to the myringotomy tray—mastoid dressings, plain and iodoform packing, 2 inch bandage, two medicine glasses.

Bandaging of an Ear: The necessary precautions in bandaging an ear are bandaging the auricle backwards with a figure-of-eight, using a 2 inch bandage. (See BANDAGES.)

Foreign Bodies in the Canal: No one but an experienced otologist should ever attempt their removal with a pair of forceps or a hook, but in nearly every case foreign bodies can be removed by syringing with water. Peas, beans and bodies that may swell if kept moist can be syringed with a small amount of alcohol if the first attempt fails.

Impacted Cerumen can be removed by syringing with a Pomeroy syringe using a warm solution of bicarbonate of soda (2 drams to 1 quart of water).

Frost Bites: The margin of the helix or rim of the auricle is the part first affected. The ear becomes yellowish white and, if badly frozen, may become brittle. The most important thing is to keep the patient from a warm room until the circulation is restored by friction gently applied with snow or ice and then ice water and keep cool.

Post-operative Treatment of mastoid cases consists largely of rectal temperature every three hours the first five days after operation, outer dressing the first day, full dressing the second day. Watch for symptoms of complications. Watch for facial paralysis and hemorrhage, possibly from the lateral sinuses.

ECHOLALIA

See SUGGESTIBILITY.

ECLAMPSIA

ECHOPRAXIA

See SUGGESTIBILITY.

ECLAMPSIA

Eclampsia may be defined as an acute toxemia occurring during pregnancy, during labor, or in the puerperium, characterized by convulsions and coma. It must be borne in mind, however, that convulsions and coma may occur during pregnancy from other toxic conditions, such as hyperemesis, as well as from uremia and epilepsy.

Period of Onset.—Eclampsia occurring in pregnancy is called *ante partum*, that occurring for the first time in labor *intra partum*, while that originating during the puerperium is known as *post partum* eclampsia. Ante partum eclampsia is rare before the sixth month of pregnancy, but becomes increasingly common after the seventh month. The relative frequency of the three varieties may be stated as

Ante partum	20 per cent.
Intra partum	60 per cent.
Post partum	20 per cent.

Etiology.—Although we do not know the cause of eclampsia with any certainty there are some facts with regard to its predisposing causes that are definitely proved.

Primiparity.—About 80 per cent. of all cases of eclampsia occur in women pregnant for the first time. Presumably the organs of such women are less able to adapt themselves to the altered and increased demands put upon them. The disease, further, is particularly common in very young and very old primiparæ. It is possible that increased intra-abdominal pressure may be an element, because primiparity has that in common with the next two predisposing causes, viz., *Hydramnios* and *Multiple Pregnancy*.

Eclampsia is frequently found in association with these conditions. Whether the connecting cause is the increased intra-abdominal pressure, or the over-distension of the uterus, it is impossible to say. In the case of twins the increased metabolism may be a factor.

Thyroid inadequacy is also to be regarded as a predisposing factor. Women in whom there is a definite hypertrophy of the thyroid during pregnancy rarely develop toxemia. There is some evidence, too, that the administration of thyroid is beneficial in cases of toxemia.

Constipation must also be regarded as predisposing to eclampsia, tending, as it always does, to increase a state of auto-intoxication.

Symptoms and Course.—*Prodromal Symptoms.*—These are really the symptoms of preëclamptic toxemia. The most

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frequent precursors of an outbreak of convulsions are disturbances of vision, flashes of light before the eyes, dizziness, headache, vomiting, epigastric pain, and a scanty secretion of urine containing much albumen and little urea. The cause of the epigastric pain is not fully understood. In all probability it is a referred pain from the liver. As a warning symptom, however, it is of the first importance. Not infrequently there are slight attacks of faintness or dizziness closely similar to *petit mal*. There may be no prodromal symptoms.

Actual Symptoms.—A fit is usually preceded by a few seconds' restlessness, with twitching and rolling of the eyeballs. Then comes the tonic stage, which may be so brief as to escape notice. The body is rigid, the head thrown back, the eyes turned up or to the side. Respiration is stopped, and there may be actual opisthotonos. This is rapidly followed by the clonic stage, the twitching beginning in the face, and being succeeded by more violent contractions of the limbs. The tongue may be severely bitten, and there may be foaming at the mouth. The veins stand out dark purple, and the whole face becomes livid and horribly distorted. This gradually passes off, and is followed by a period of coma with deep, stertorous breathing.

A fit usually lasts for a minute or a minute and a half, rarely longer. During it the patient is quite unconscious, and the pupils do not react to light. Feces and urine may be passed.

The length and depth of the coma depend on the number of fits. It becomes deeper and longer as the fits increase in number and the intervals between them are shortened. In severe cases the fits may succeed each other so rapidly that there is no appreciable interval. In others the patient is comatose during the entire interval. In mild cases there are few fits at long intervals, and the patient recovers consciousness between them. The number of fits varies from one to more than one hundred. They may be excited by external stimuli. Labor pains may excite them, and on the other hand they may, and often do, stimulate labor pains, and frequently particularly violent and prolonged pains. If the fits continue, the pulse rate becomes greatly accelerated, the pulse being small and of very high pressure. The temperature also rises from interference with the heat regulating center, and very high temperatures may be registered in bad cases. If improvement sets in, the pulse rate and temperature fall again. If improvement does not occur the heart begins to fail, and this is followed by edema of the lungs. Aspiration pneumonia and cerebral hemorrhage may complicate the case.

Diagnosis.—In making a diagnosis reliance must be placed

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on the history, the symptoms immediately preceding the attack, and the nature of the fits if observed. The fits may, however, be atypical.

The condition of the urine is of importance if the case has not been seen before. It is always diminished in quantity, and in bad cases may be entirely suppressed. Sufficient for a rough examination can usually be obtained by catheterization. It is loaded with albumen, and if boiled undiluted frequently turns solid. Hyaline, granular, and epithelial casts are numerous, as well as blood cells. If sufficient urine is available for a more elaborate examination, the total nitrogen output is found to be low, the urea diminished, and the undetermined or "rest" nitrogen is greatly increased. The ammonia coefficient is variable.

Epilepsy can usually be diagnosed by the history, the presence of an aura, and perhaps of a cry at the outset of a fit. The state of the urine is important. The fit is usually a single one. *Uremia* cannot as a rule be diagnosed from eclampsia without a knowledge of the patient's having had previous renal disease, and often not before the autopsy. *Acute yellow atrophy of the liver*, and *acute phosphorus or strychnine poisoning* must be borne in mind, but can usually be ruled out owing to their rarity. *Acute meningitis*, and *cerebral tumor*, may simulate eclampsia, but can generally be distinguished by close observation of the symptoms, and by appropriate special methods such as a diagnostic lumbar puncture or an ophthalmoscopic examination respectively.

Eclampsism.—This term is applied to the rare condition of "eclampsia without fits." It is really an extreme degree of preëclamptic toxemia, the patient passing into a drowsy or even comatose state. Death frequently results, and *post mortem* the changes characteristic of eclampsia are found. The diagnosis rests on the history, the state of the urine, and possibly the retinal changes.

Prognosis.—This is grave for both mother and child. Speaking generally the maternal mortality is about 25 per cent., and the fetal 50 per cent., but individual cases vary so much that statistics are little guide.

The general opinion is that the prognosis is worse in multiparæ than in primigravid women.

It is also generally believed that the earlier the fits come on in pregnancy, the worse is the outlook. Ante and intra partum cases are usually regarded as more severe than post partum cases, but there is a sharp division of opinion regarding the prognosis in the last named. Many authorities regard it as the most grave variety of all.

In ante partum cases the death or expulsion of the child is usually followed by the cessation of the fits, and in intra

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partum cases the fits tend to stop after the uterus is emptied.

Signs of good prognostic significance are (1) few fits; (2) long intervals between fits; (3) recovery of consciousness in the intervals; (4) marked general anasarca.

Bad signs are—(1) many fits; (2) short intervals; (3) persistence of coma in the intervals; (4) a very small quantity of albumen in the urine; (5) pyrexia; (6) onset early in pregnancy or after the second day of the puerperium; (7) high arterial pressure.

Treatment.—This naturally falls under two heads—general medical treatment (a) of the fits, and (b) during the intervals, and, secondly, obstetrical treatment. In the description of treatment that follows it must be understood that obstetric treatment may be adopted at any stage, either before, during, or after the medical treatment, according to the nature of the case and the opinion of the physician.

Treatment of a fit consists in preventing the patient from damaging herself. A gag—the handle of a spoon wrapped in a towel does well—should be placed in the mouth to prevent the tongue from being bitten. Chloroform should be administered if possible. Ether is better owing to its having less action on the liver, but its slower action makes it useful only where the administration has to be prolonged. The patient should be placed on her side as soon as possible to prevent the secretions of the mouth from running back into the lungs.

Medical treatment is based upon two principles: Firstly, to prevent the nervous explosions by protecting the patient from anything that would stimulate a convulsion, and by administering sedatives. Secondly, to flush the toxins out of the body by every possible channel of elimination.

The sedatives mostly used are morphine and chloral. Morphine may be given in a dose of half a grain hypodermically, and followed by repeated doses of $\frac{1}{4}$ of a grain every two hours, not more than three grains being given in twenty-four hours. This satisfactorily checks the fits in most cases and lowers the blood pressure. An objection to its use is that its tendency to stop the metabolism of the body also diminishes the secretions and excretions. Chloral may also be used, thirty grains of the hydrate per rectum every two hours till the fits cease, not more than three drams being given in the twenty-four hours. It is more depressing to the heart than morphine and hardly so effective. Ether will probably need to be used along with it, whereas after the morphine has produced its effect an anesthetic is rarely required.

While the patient is comatose or anesthetized a stomach

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tube should be passed, and the stomach washed out with a weak solution of bicarbonate of soda. Six ounces of magnesium sulphate in a saturated solution should then be poured down the tube and left in the stomach. Failing the use of the tube, one to two minims of croton oil should be rubbed up with a little butter and placed well to the back of the tongue. If, on the other hand, the patient is sufficiently conscious to swallow, she should be given a potent purge, such as six grains of calomel along with a dram of jalap. It is well, at the same time, to empty the lower bowel at once by means of large warm water enemata, repeated until all the solid matter is removed. Frequently these patients have been very constipated, and much exceedingly offensive matter, which must of necessity be highly toxic, is removed in this way. This flushing of the colon with hot fluid also tends to stimulate the kidneys. Their action may be further increased by hot fomentations or poultices applied to the flanks. The skin may be stimulated by hot packs or hot air baths, the condition of the pulse being carefully watched.

Where there is very high arterial pressure, or where the fits continue after the birth of the child, venesection should be done, and ten or fifteen ounces of blood removed. This removes a certain amount of the toxin, and the remainder may then be still more diluted by the administration of saline per rectum very slowly (one pint in half an hour, repeated every four to six hours as necessary), or into the loose cellular tissue under the breast. Diuretic salts (*e.g.* acetate of soda, 30 grains to the pint) may be added, and this is a rapid and effective method of stimulating the kidneys.

Even when venesection is not practised, the administration of salines per rectum or under the breast is very useful, having a potent diuretic influence. In view, however, of the tendency to edema of the lungs, this form of treatment should not be persisted in unless it is accompanied by free removal of the fluid by the kidneys, bowels, and skin. If this precaution be overlooked the patient will become increasingly waterlogged and die.

During the acute period of the disease the patient should get no food of any description, for she is totally unable to digest it. If she is conscious she should be encouraged to drink as much water as possible. Care must always be exercised to see that she can really swallow before anything is given to drink.

The condition of the heart must be carefully watched, and stimulants given hypodermically if necessary—strophanthin, digitalin, and brandy being the most useful.

ECTOPIC GESTATION

No active treatment should be done unless the patient is comatose, or under the influence of morphine or ether, otherwise the effect will be to stimulate and excite more fits. As soon as the active part of the treatment is finished she should be placed in a quiet, darkened room, under the charge of a skilled nurse, all external stimuli being as far as possible removed. The nursing is of the first importance. The patient must be kept on her side, and turned from one to the other at intervals, to let the saliva run out of the mouth.

The above is an outline of a safe and rational form of general medical treatment. There are, however, many other drugs and methods that have been vaunted from time to time.

Obstetrical Treatment.—At the outset it must be explained that there are two schools of opinion in regard to the obstetrical treatment of eclampsia. The one believes in emptying the uterus as soon as possible; the other believes in leaving the uterus severely alone, allowing labor to come on spontaneously and then expediting delivery.

See CONVULSIONS.

ECTOPIC GESTATION

See EXTRA-UTERINE PREGNANCY.

ECZEMA

See SKIN DISEASES.

EFFERVESCENT BATH

See NAUHEIM BATH.

EFFERVESCENT DRAUGHT

See SALINE DIURETICS.

ELATERIN

Elaterium is the juice obtained from the fruit of *Ecballium elaterium*, or *squirting cucumber*. This fruit contains an inner sac which is filled with juice and contains the seeds. The dried juice is elaterium, from which is obtained **elaterin**, the active principle, which is the resinous substance used.

Locally: Elaterin is very injurious to the skin. It frequently causes inflammation and ulcers on the fingers of those who constantly handle the drug.

Internally: It is the best drug to produce fluid stools and is therefore used to remove fluid from the tissues in the cases of edema and ascites. It is also used to reduce blood pressure in cases of apoplexy.

Elaterin is frequently given hypodermically.

EMETINE

Preparations

Elaterin; dose $\frac{1}{60}$ to $\frac{1}{10}$ of a grain.

Triturate of Elaterin; dose $\frac{1}{4}$ to 1 grain. It contains 1 part of elaterin to 9 parts of sugar of milk.

ELIXIR

Elixirs are palatable preparations of drugs. They are made up with alcohol, sugar and some aromatic substance. They usually contain very small quantities of the drug.

EMBOLISM, PULMONARY (POST-OPERATIVE)

See PULMONARY EMBOLISM (POST-OPERATIVE).

EMETICS

These are drugs which produce vomiting. There are two classes: (1) *Local emetics* which act by irritating the stomach, such are Mustard, Salt, Warm water, Zinc Sulphate, Copper Sulphate, Alum, Turpeth mineral; (2) *General or Systemic Emetics* which are carried by the circulation to the vomiting center in the medulla. The chief general emetics are Ipecac, Emetine, Apomorphine, Tartar Emetic.

Preparations

Tartar Emetic (Antimonii et Potasii Tartras), as an emetic; dose $\frac{1}{2}$ to 2 grains.

This preparation is also contained in the compound syrup of squill.

Wine of Antimony, as an emetic; dose 1 to 4 drams.

Contains 4 parts of Tartar Emetic to 1000.

Zinc Sulphate; dose 10 to 30 grains.

Copper Sulphate; dose 3 to 5 grains.

Copper sulphate is the best emetic to use in cases of Phosphorus poisoning.

Alum; dose 1 dram.

Alum is best given in molasses or in the syrup of ipecac.

Turpeth Mineral (Yellow Mercurous Subsulphate) Hydrargyri Subsulphas Flavus; dose 1 to 5 grains.

This is given every ten or fifteen minutes until free vomiting occurs.

Warm water given continuously will also cause vomiting.

Salt (sodium chloride) is given in solid form or in concentrated solutions to produce vomiting.

Mustard is frequently used to produce vomiting. A teaspoonful to a tablespoonful of the mustard powder is given in tepid water, and is repeated in fifteen to twenty minutes if no effects are produced.

EMETINE

See IPECAC.

EMMENAGOGUES

EMMENAGOGUES

Emmenagogues are drugs which increase menstruation.

Many drugs, such as iron, arsenic, or strychnine, which improve the general condition of the patient, will increase menstruation.

Many cathartics, such as castor oil or aloes, when given improve the general condition of the patient, will increase menstruation.

Counterirritants, such as mustard or cantharides, when taken internally, will also increase menstruation.

The substances used principally to increase menstruation, however, all contain volatile oils which are their active principles. The chief of these are: Savine, Rue, Tansy, Apiol, Pennyroyal, and Gossypium. These volatile oils are responsible for the following severe poisonous symptoms that result from large doses:

Poisonous Symptoms of Volatile Oil Emmenagogues

1. Abdominal pain.
2. Nausea and vomiting.
3. Profuse diarrhea with bloody stools.
4. Abortion.
5. Scanty, bloody urine.
6. Convulsions.
7. Unconsciousness.
8. Collapse.

EMPHYEMA

One of the complications that may occur in chest conditions is empyema, an infection of the pleural cavity. This is usually the result of a pneumonia and rarely occurs as a primary condition.

Symptoms.—The patient gives a previous history of pneumonia, as a rule. After the pneumonia has resolved, or even before this period, a sudden rise in temperature may occur, accompanied by fever, chills, and the physical signs of fluid in the pleural cavity. This collection of fluid or pus may be general in nature, or localized (sacculated). As pus in other parts of the body usually requires drainage as soon as it is formed, here also an attempt should be made to remove it.

Treatment.—While it was customary before the war to resect a rib and insert a drainage tube into the pleural cavity as soon as a diagnosis of empyema was made, army experience has taught that such radical procedure is not always necessary. In fact, in the beginning, it is better to draw off the fluid which has accumulated with a needle and syringe, or Potain aspirator, thereby relieving the patient, and at

EMPHYEMA

the same time, reducing certain elements which might lessen the shock at the time of the future operation. It is also true that some of the patients recover with this simple aspiratory procedure, although the great majority must have a more radical operation performed sooner or later. The more radical procedure consists in the partial excision of one of the lower ribs so that better and more adequate drainage may be secured.

Operative Treatment.—Inasmuch as these patients are in a weakened physical condition from their pneumonia, or from the absorption of the poisons of the pus in the pleural cavity, it is advisable not to administer a general anesthetic, but to employ local anesthesia. This works with remarkable success.

Since the patients feel more comfortable when sitting almost upright, the operation is performed in this position. An aspirating needle with syringe locates the area of pus; its location is the determining factor as to which rib is to be partially resected. In general empyema or suppurative pleurisy, the incision is generally made along the eighth or ninth ribs. A part of the rib is removed subperiosteally, exposing the periosteum beneath which is the outer surface of the pleura. The pleura is then opened by incision and the pus allowed to gradually escape. A drainage tube is then placed into the pleural cavity.

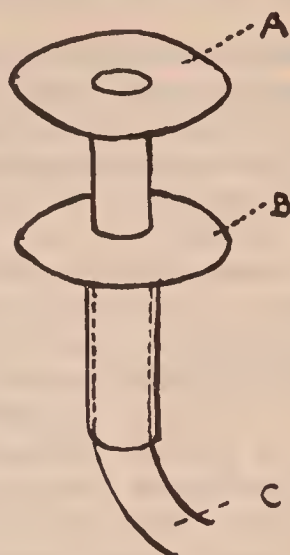
There are many ways of draining the thoracic cavity. Some employ a Brewer tube; others a simple rubber drainage tube. In empyema cases, great care should be taken that the number of drainage tubes used be carefully noted and recorded. The pleural cavity is a notorious hiding place for them, and very often a lost tube is the reason for a persistent sinus continually discharging large quantities of pus.

After-Treatment.—Inasmuch as the discharge from the pleural cavity is moderately free, very often the drainage tubes are connected with bottle drainage. Occasionally, when a Brewer tube is employed a piece of rubber dam is snugly fitted around the free end of the drainage tube, and the open end of the dam is placed in a bottle under a water level so that while the pleural fluid may escape from the chest no air can enter the pleural cavity. The result of this is that a negative pressure is soon established, the lungs expand earlier, and the patient's convalescence is shortened.

The discharge is rather copious for the first few days and superficial dressings must be changed and reinforced whenever necessary. After a few days the tubes within the chest are gradually shortened, and as soon as the discharge is very thin and the temperature is normal, the tubes may be

EMULSIONS

withdrawn altogether. While the patients are in bed, they should be encouraged to breathe as deeply as possible so as to aid the expansion of the collapsed lung. With this end in view, they should blow fluids from one bottle into another, and children should be given those toys which encourage blowing, such as horns or balloons. If the tem-



Brewer's empyema tube. A, rubber disc resting tightly against parietal pleura; B, rubber disc resting tightly against skin; C, rubber tube connected to bottle drainage.

(From Colp and Keller's Textbook of Surgical Nursing)

perature suddenly rises after the drainage has been removed, it simply means a reaccumulation of fluid in the pleural cavity, and necessitates an immediate reinsertion of the tube.

These patients should be allowed out of bed as soon as possible, and wheeled into the open air. If the weather is clear, their beds might even be moved into the open. The diet should be high in carbohydrates, and tonics should be given to restore their lost strength.

EMULSIONS

Emulsions are solutions of oily substances which contain the oil divided up into fine globules. They are usually of a milky color and consistency.

ENEMATA

Enemata are used for various purposes, and every one should know how to give an enema in case of emergency, either as a purgative, stimulant, or for nutrition. There are various medicated enemata prescribed by the doctor; for removal of flatulence, in treatment of diarrhea, to expel

ENEMATA

worms, etc. Such are enemata containing turpentine, asa-fetida, quassia, etc., but medication does not lie within the province of the Nurse. The doctor will give directions when and how these medicated enemata are to be given. They are followed usually with soapsuds enema.

Purgative enemata. Soapsuds solution to cleanse the bowels is made with the purest soap (generally ivory or castile; never use laundry soap), and about two or three pints of hot water, for an adult; for a child, one pint is sufficient. When your soapsuds solution is ready its temperature should be 105° F., for by the time the solution enters the bowels it will be much cooler. The solution is poured into a fountain syringe bag, or douche can, which is hung up about two feet above your patient. A clamp is necessary on the rubber tubing to regulate the flow of the solution. When possible use a rubber rectal tube, and connect it with the tube of the fountain syringe by a small glass connecting tube. The soft rubber rectal tube is better than the hard rubber end supplied with the fountain syringe bag, for two reasons; it will reach up higher into the bowel, and is so soft that it will not injure the tender mucous membrane lining the intestines.

Giving the enema. Let the patient lie upon the left side, with knees drawn up (this will relax the muscles of the abdomen); protect the bed with a piece of rubber sheeting and a bath towel or cotton sheet. Turn down the bedclothes, and cover your patient with a blanket.

Allow some of the solution to flow through the tube, so that all gas may be expelled; then oil the rectal tube, and insert gently, and slowly, without pressure.

Should you feel any obstruction (probably caused by fecal matter), allow a little solution to run into the bowel, and it will be overcome. After the tube has been inserted about five or six inches, open the clamp and allow the solution to flow slowly. If pain is caused, shut the clamp on the tube and stop the current for a minute, then let it flow again. Never hurry the giving of an enema; allow about fifteen minutes; because the slower the solution enters the bowels the better will be the result. After removing the tube, press a towel against the anus. If the patient lies quiet and retains the enema for fifteen or twenty minutes, you will have a good result.

When there is a good deal of constipation the enema will be more successful if given in the knee-chest position, that is, with the patient resting on the knees and chest in bed, the head very low; also use the long, flexible rubber rectal tube on the end of the syringe. This is called a **high enema**. Adding olive oil and glycerin to the soapsuds will prove

ENEMATA

effective if the simple enema is not sufficient. About one ounce of oil and half an ounce of glycerin is the usual amount. Castor oil may also be given in this way; but it is necessary to consult the doctor before using any medication besides the plain soapsuds.

Oil enemata. Sometimes the doctor orders an oil enema to be given first and retained for an hour, followed by a soapsuds enema. In that case, six ounces of hot olive oil are injected first and allowed to work slowly through the bowels before giving the soapsuds enema.

Starch enemata. In cases of acute diarrhea these enemata are sometimes ordered, and are made by mixing a dessertspoonful of starch with cold water into a smooth paste and then adding three ounces of boiling water. Boil two or three minutes; add sufficient water to make the mixture as thick as cream. It must be as cool as 103° F. before using. Sometimes a Davidson bulb syringe is found best to give the medicated enemata, as the medication can be forced through the tube better than with an irrigation bag. A small rubber catheter or rectal tube should be attached to the nozzle of the bulb syringe and inserted into the rectum.

Stimulating enemata. These are given in cases of shock or collapse, and should be very hot, as they will be more easily retained. The usual amount is one tablespoonful of whiskey or brandy, and four ounces of very hot water, as hot as the patient can stand; or salt solution, is sometimes substituted.

Hot water should be run through the syringe first, that the tube may be thoroughly heated, and the enema should be given with a long flexible rectal tube, as it must go into the upper bowel to be retained.

Nutritive enemata. When the stomach is much disturbed during a severe illness so that food cannot be digested, or in cases of delirious patients, and after some operations about the mouth and throat, nutritive enemata are given to nourish the system. They are sometimes kept up for days and weeks. Various formulæ are used; one of the best is: Peptonized milk two ounces; one tablespoonful of whiskey, and one egg with a pinch of salt. (Peptonized milk may be made with Fairchild's tubes of peptonized powder.) Peptonized beef extract, or beef juice may also be used. The milk is heated, but not over 115° F., then add the beef if used, and the egg mixture, beating it up. A simple soapsuds enema once a day is necessary to wash out the lower bowel, when your patient is fed by nutritive enemata.

Enemata given to children. Children do not retain the solution from an enema long enough to cause a proper

ENTEROCLYSIS

result. It is better to place the child on the bedpan before trying to give the enema. A rubber catheter is used instead of a rectal tube, and salt solution is considered less irritating for a child than soapsuds. (See RECTUM, ADMINISTRATION OF MEDICINES BY.)

Enemata (Post-operative)

Especially in emergencies when the patient has not had a cathartic, or a thorough intestinal cleansing before the operation, the fecal material is apt to accumulate in the colon causing fermentation and often stopping the passage of gas or flatus by its mechanical bulk. In these conditions it is important to empty the lower bowel by a cathartic enema. The soapsuds enema is usually all that is required. But in those cases where the soapsuds have brought very little return, and the distention is still marked, and it is thought that fecal material is being retained, it is advisable to give a more purgative enema. The solutions which may be added to enemata may be glycerin, one ounce, or turpentine, $\frac{1}{2}$ ounce to the pint. Milk and molasses,—four ounces of milk and four ounces of molasses,—make a good irritative enema. The magnesium sulphate enema is used now quite frequently,—two ounces each of water, glycerin and magnesium sulphate in saturated solution being employed. Some institutions use a mixture with oxgall in the following proportions: turpentine 2 drams, oxgall 2 drams, magnesium sulphate 4 ounces, glycerin 4 ounces.

These purgative, irritative enemata, not only empty the lower bowels, but also stimulate the smooth muscles to contract, thus expelling the gas which has accumulated. Irritative enemata for safety's sake should be small in amount. The soapsuds enema, however, made from castile or ivory soap, is given in amounts varying from two to four pints. After operation, it is best to give the enema in the dorsal position, putting the douche pan under the patient before the enema is given. The returns should be watched for the presence of fecal material, mucus, blood, bile, and gas. Enemata after operation should always be ordered by the attending physician, and no nurse should take upon herself the responsibility of injecting fluid into the rectum. As a rule, they should not be given in rectal cases, perineorrhaphies, or resections of the colon unless absolutely essential.

ENTAMEBIC DYSENTERY

See DYSENTERY.

ENTEROCLYSIS

See COLON IRRIGATION.

ENZYMES

ENZYMES

The chemical changes in the food materials, after they are eaten, are brought about through the action of certain substances known as soluble ferments or "enzymes." These enzymes exist in every tissue of the body, and their province is to break down the food materials into simpler compounds.

	ENZYMES	WHERE FOUND	ACTION
Act upon carbohydrates	Ptyalin	Salivary secretions	Converts starch to maltose
	Amylopsin	Pancreatic juice	Converts starch to maltose
	Liver diastase	Liver	Converts glycogen to glucose
	Invertase	Intestinal juice	Converts glycogen to glucose and fructose
	Maltase	Intestinal juice	Converts maltose to glucose
Acts on fats	Steapsin	Gastric, and pancreatic secretions	Splits fats to fatty acids and glycerin
	Pepsin	Gastric juice	Splits proteins to proteoses and peptones
Act on proteins	Trypsin	Pancreatic juice	Splits proteins to proteoses, peptones, polypeptids and amino acids
	Erepsin	Intestinal juice	Splits peptones to amino acids and ammonia

EPILEPSY

As Sherman has stated, "all fermentation is brought about either directly or indirectly by the activity of animal or vegetable organisms or cells. When the organisms or cells act directly and the chemical changes occur only in its presence, the fermentation is said to be due to an organized ferment. When the action is not brought about directly by the cell itself, but by means of a substance secreted by the cell but acting apart from it, this substance is called a soluble or unorganized ferment or 'enzyme.'" The chief enzymes concerned in digestion and metabolism, their source and their action, may be found in the preceding table:

EPIDIDYMS

See TESTICLE.

EPIDIDYMITIS

See TESTICLE.

EPIGLOTTIS

See LARYNX.

EPILEPSY

This is a disease which is characterized by attacks of sudden disturbance of consciousness with or without convulsions and tends towards mental deterioration.

The symptoms may be mild or severe. In the mild form or **petit mal** there may be a feeling of dizziness and temporary loss of consciousness with or without muscular spasm, or there may be slight muscular twitching with very slight momentary loss of consciousness, and the patient proceeds with whatever he was doing.

Grand mal is the type usually seen in hospitals. The convulsions are severe and unconsciousness is prolonged. The attacks are often preceded by an "**aura**" or warning, and the patient complains of unusual sensations, numbness, a peculiar taste, a bright light, etc., then cries out and losing consciousness falls heavily, "as if shot." This disease was at one time called the "falling sickness." Injuries are frequent, because in falling no attempt is made to protect or save one's self. The tonic stage immediately begins; the whole body becomes rigid, the jaws are fixed, the eyes open and staring or rolled backward, and the face becomes increasingly cyanosed due to the loss of the respiratory movements. This stage lasts but a few seconds and is quickly followed by the clonic stage, marked by convulsive action of all the muscles, mild at first, then becoming violent, then less severe, and finally ceasing. The body then relaxes and the patient lies unconscious, breathing heavily and often frothing at the mouth. During the convulsion the tongue

EPILEPSY

is bitten and urine and feces are passed involuntarily. On regaining consciousness there are muscular soreness, headache and confusion during which certain movements may be automatically performed. While in this state of bewilderment some patients become dangerous.

Status epilepticus is a condition in which the convulsions are almost continuous, one attack following another with only short intervals between. Consciousness is not regained, the temperature is high, the pulse and respirations are increased in rate and exhaustion may soon follow; or the intervals between the attacks may lengthen, the convulsions become less severe and recovery ensues. This condition may occur at any time during the course of the disease, although it usually proves terminal.

Instead of the convulsions there may be certain states which are known as the “**equivalent.**” These may take the form of simple excitement, or of furor in which the patient becomes noisy, violent, destructive, even homicidal, refuses food, is disoriented and consciousness is clouded; or, of dream states in which the patient is dazed, disoriented and has hallucinations; or, of ecstasy in which the patient is extremely happy and has hallucinations—hears beautiful music and sees heavenly visions; or, of automatic states in which the personality is different, and the patient has no memory of his former self, wanders away, engages in unfamiliar work, but lives and acts in such manner as not to arouse suspicion that he is in an abnormal state.

In the **intervals between attacks** some epileptics are bright, good natured and able to carry on their regular work, but many others are irritable, egotistical, selfish, stubborn, abusive and quarrelsome, and show frequent outbursts of anger on very slight provocation. The mental condition becomes gradually weakened, and sensation, perception, attention and memory show impairment. Delusions and hallucinations may occur, but orientation is usually not disturbed.

Nursing procedures. Carefully note the character of the aura and where the convulsions begin. Loosen the clothing about the neck and waist, so that the respiratory movements may be free. Place a cork or padded mouth gag or clothespin between the teeth to protect the tongue which otherwise may be badly mutilated. If the attack begins while the patient is eating, try to remove the food from the mouth and place the head as low as possible to prevent aspiration and choking. If the patient falls on to the floor, make no attempt to move him, but straighten the body and place in position in which least injury can be done; place pillows or folded blanket or garments under the head and arms; hold the jaw forward, wipe the mucus from the mouth

EPINEPHRIN

and let the convulsion work itself off. After the muscular movements cease, place the patient in bed, change the clothing, bathe the face, treat the mouth by swabbing with antiseptic solution and apply an ice bag or cold compresses to the head.

Other nursing measures should be to establish regularity in diet which should be simple, of easily digested foods served in limited quantity, for these patients tend to overeat, to crowd and push the food into the mouth and choke. Not an uncommon occurrence when supervision is relaxed is the aspiration of a large bolus of food, often with fatal consequences. Meat should be sparingly given, and the evening meal should always be light, for attacks are more frequent during the night, and indiscretions in diet will often produce an attack. Regularity in bathing and elimination is very important. Constipation is a common ailment and seems to contribute in causing attacks. Give water freely to drink, for this is a valuable aid in elimination. In status epilepticus sedatives are given per rectum, and the nurse may have to administer chloroform to lessen the severity of the convulsions, but this is never done without an order from the physician.

Occupations. While some intellectual people have been subject to epilepsy, the general tendency is towards deterioration, and in patients who come to hospital this symptom is more or less pronounced. The occupation must, therefore, be adapted to the individual patient. Some simple, easy work may be given, but never near a stove or radiator, hot water or machinery, or where there is any danger from falling. The use of pointed scissors or other sharp instruments like knives should not be permitted because of the danger of sudden and unprovoked attacks on other patients. This is especially to be guarded against after a convulsion.

EPINEPHRIN (ADRENALIN)

Epinephrin is an extract containing all the active principles of the suprarenal or adrenal glands of the sheep or ox.

Adrenalin is a patented name for epinephrin.

Appearance of the Patient

After an intravenous or hypodermic injection of epinephrin, the following effects are noticed within 15 or 20 minutes after it is given:

The skin becomes pale, all the visible mucous membranes, such as the lips and conjunctiva, become pale and blanched. The pupils are dilated. There is an excessive secretion of saliva and mucus in the mouth.

The pulse is slow, strong, and tense; the blood pressure

EPINEPHRIN

being greatly increased, so that it is difficult to obliterate the pulse by pressure with the finger. The breathing is somewhat deeper. These effects wear off in an hour.

Local action: **Applied to the skin,** epinephrin has no action. If applied to a bleeding point, it checks the bleeding by contracting the blood vessels. **On mucous membranes:** It makes the mucous membranes pale by contraction of the underlying blood vessels.

Internal Action: **In the mouth:** Epinephrin contracts the mucous membrane, from which it may be slightly absorbed.

Since epinephrin is an extract of a gland, it is digested by the gastric juice of the stomach. It therefore produces no general effects when given by the mouth. To obtain its effects, it must be given either intravenously, intramuscularly or hypodermically.

Action after Absorption

When given intravenously, the effects appear in about five to ten minutes. When given intramuscularly or hypodermically, the effects appear within a half hour.

Action on the blood vessels: It makes all the small blood vessels, especially the small arteries, narrower by contraction of the small muscle fibers in their walls. The blood vessels in the abdomen are contracted most of all, those in the brain and lungs least. The coronary vessels in the heart are dilated, however. By the contraction of the blood vessels it greatly **increases the blood pressure**. It is the best drug for increasing the blood pressure.

Action on the heart: Epinephrin makes the heart beat slower and stronger.

Action on involuntary muscles: Epinephrin increases the contractions of the involuntary muscles of the uterus, and its blood vessels. The involuntary muscles of the **stomach and intestines** are **relaxed**, though the blood vessels in their walls are contracted. **Action on the Pupil:** The pupil of the eye is widened (dilated) by contraction of the radial fibers of the iris, or colored part of the eye.

Action on the secretory glands: The secretions of all the secretory glands, except the sweat glands and the pancreas, are increased by epinephrin. It often causes sugar in the urine (glycosuria).

The effect of epinephrin wears off very quickly; usually in about 15 minutes to an hour.

Poisonous Effects

Overdoses of epinephrin cause the following symptoms:

1. Slow, irregular pulse.
2. Pale, blanched skin.

EPINEPHRIN

3. Dilated pupils.

From still larger doses the following symptoms will also occur:

1. Rapid, weak, thready pulse.

2. Collapse: Pale, cold, moist skin, slow and shallow breathing, and dilated pupils.

A single overdose may cause such profound collapse, that death may result.

Uses

Epinephrin is used for the following conditions.

1. **To check bleeding** by contracting the bleeding vessels. It is only of value in bleeding from the small blood vessels. The bleeding may start up again, however, when the effect of the drug wears off, because after the blood vessels are contracted, they soon dilate again.

In bleeding from the nose, stomach, intestines, uterus or bladder, epinephrin is very valuable, if it can be applied to the bleeding spot without the necessity of an elaborate surgical procedure.

2. **As a heart stimulant**, especially where a rapid effect is desired. The effect soon wears off, however.

3. Epinephrin is often used together with cocaine. It contracts the blood vessels, lessening the absorption of the cocaine, which is then less apt to cause poisonous effects.

4. In the treatment of Addison's disease (tuberculosis or cancer of the adrenal glands). It then supplies the absent secretion of the adrenal glands.

Preparations

Dried Suprarenal Glands; dose 4 grains.

Epinephrin Chloride (1:1000 solution); dose 5 to 15 minims.

Adrenalin Chloride Solution; dose 5 to 15 minims.

This is a 1:1000 solution of adrenalin chloride, the active principle of the suprarenal glands, in normal salt solution.

Adrenalin Inhalant

This is a 1:1000 solution of adrenalin chloride in oil.

Adrenalin Ointment

An ointment of adrenalin chloride 1:1000 in strength.

Adrenalin Suppositories

A 1:1000 solution of adrenalin chloride in cocoa butter.

Adrenalin Tablets

Each tablet contains $\frac{3}{200}$ of a grain of adrenalin borate. Each tablet when dissolved in 15 minims of water makes a 1:1000 solution.

Administration

Epinephrin is given intravenously, intramuscularly, or hypodermically. When it is given intravenously, it must be injected very slowly, to avoid poisonous effects.

EPSOM SALT

For local effect, it is used in 1:15000 to 1:1000 solutions, preferably in oil.

EPSOM SALT

See MAGNESIUM.

EPISTAXIS

Epistaxis or **Bleeding from the Nose** is a capillary hemorrhage from a deeply congested mucous membrane. It may be profuse and long continued.

Causes of Epistaxis

1. Local causes.—Traumatism, ulceration (frequent on the septum), foreign bodies, new growths, picking and scratching with the fingers.

2. Constitutional causes.—Plethora, hemophilia, chronic anemia, preceding certain fevers especially typhoid fever, venous congestion occurring in cardiac or pulmonary diseases or cerebral congestion, puberty in delicate children especially those with a rheumatic tendency. There may be an hereditary tendency to it.

Epistaxis may occur during sleep, the blood swallowed later being vomited, and so confused with hematemesis; or the blood may be coughed up and so confused with hemoptysis.

Treatment.—The patient's head should be kept erect, to aid the venous return. He should not bend over a basin or wear a tight collar. The clothes should be loosened. Raising the arms above the head will lessen the blood supply to the nose.

The blood tends to clot and spontaneously check the bleeding. The patient should be warned not to blow his nose or in any way loosen the clots. Ice or ice compresses should be applied to the forehead, the bridge of the nose, and back of the neck. Ice may be pressed against the nose. Very hot or cold water may be injected into the nostrils.

Compression may be made on the facial artery by pressure on the superior maxilla near the nose on the bleeding side. Spunk may be inserted in the bleeding nostril. When moist, it swells and in this way local pressure is applied which helps to check the bleeding. The anterior nares may be packed with sterile gauze or cotton.

Astringents may be injected, or dropped into the nostrils, or cotton, moistened with astringents, may be pressed into the nostrils. Adrenalin chloride 1:1000 solution, compound tincture of benzoin, Monsel's solution, peroxide of hydrogen, or hamamelis, etc., may be used. Ergot may be given internally when bleeding continues.

A hot foot-bath may check bleeding by dilating the blood

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vessels in the extremities and drawing blood away from the head. When considerable blood has been lost, this may cause fainting, unless given in the recumbent position.

When the above means are unsuccessful the posterior nares must be packed.

ERGOT

Ergot is a black parasitic fungus, which grows on the rye plant, **Secale cereale**, the fungus taking the place of the rye grain.

The active principles are the alkaloids: **ergotoxine**, **ergotine** and **tyramine**.

Appearance of the Patient.—Ergot is usually given to patients for bleeding from the uterus, or to contract the uterus immediately after childbirth.

Within fifteen minutes to a half hour after a dose of a preparation of ergot is given, the patient usually complains of violent cramp-like pains in the lower part of the abdomen, particularly in the region of the uterus. If there has been bleeding from the uterus, this is gradually lessened.

There may be nausea, and later, frequent movements of the bowels. The pulse is usually slow and strong.

Local action: Ergot produces no effect on the skin. If it is given hypodermically, it is quite injurious to the tissues, and is apt to cause an abscess at the site in injection. On **mucous membranes:** It causes redness and swelling, with profuse secretion of mucus.

Internal Action: **In the mouth:** Ergot has a very unpleasant taste; it often increases the flow of saliva because of the irritation of the mucous membrane of the mouth.

In the stomach: All the preparations except the active alkaloids may cause nausea and vomiting.

In the intestines: Ordinary doses lessen peristalsis. Poisonous doses increase the secretions and peristalsis of the intestines, causing frequent bowel movements.

Action after Absorption

Action on the uterus: This is the most important action of ergot. **Ergot increases the contractions of the uterus.** It produces wavelike contractions of the uterine muscles, which expel the contents of the uterus. It does not always start uterine contractions, but it always increases them when they are once started. By contracting the uterus, ergot contracts its blood vessels and stops uterine bleeding.

Action on the heart: **Ergot makes the heart beat slower**, principally as a result of its effects on the blood vessels.

Action on the blood vessels: The blood vessels are made narrower, by the contractions of the small muscle fibers in

ERGOT

their walls. The narrow blood vessels increase the blood pressure, and offer a greater resistance to the contractions of the heart, which are then stronger and slower. The **pulse** of ergot is therefore **slow and strong**. The effect is similar to that of epinephrin or pituitary extract but is not as marked.

Action on secretions: The secretion of sweat and milk is lessened.

Acute Ergot Poisoning

Acute ergot poisoning is very rare and usually occurs from large doses of ergot, taken to produce abortion.

Symptoms.—1. Cramp-like abdominal pain.

2. Vomiting.
3. Diarrhea.
4. Bleeding from the uterus.
5. Abortion.
6. Hemorrhages into the skin.
7. Tingling and itching of the skin, or numbness.
8. Collapse (rapid, weak pulse, cold skin, slow and shallow breathing, etc.).

There may be convulsions before death.

Treatment.—1. Wash out the stomach.

2. The collapse is treated with heart stimulants, such as caffeine, strychnine, etc.

Chronic Ergot Poisoning

Chronic ergot poisoning results from eating rye bread made from rye infected with the ergot fungus. This is more apt to occur in the rye growing during wet seasons.

Ergot poisoning is very common in Russia and other northern countries, where a good deal of rye bread is eaten.

There are two forms of chronic ergot poisoning:

1. **The Gangrenous Form**
2. **The Spasmodic Form**

Gangrenous Form

This is due to the persistent contractions of many of the blood vessels. As a result, various parts of the body, such as the fingers, the toes, the ears or the tip of the nose may be deprived of their blood supply, and the part affected then dies or becomes gangrenous.

Symptoms.—The limbs are first affected. **The fingers and toes become cold**, they lose their sensation, and become blue in color. **Soon they become hard and shriveled up and fall off**, without causing pain. Sometimes the gangrene spreads up over the extremities, and the forearm or leg may become gangrenous. Occasionally areas of gangrene may form in the internal organs. **Ulcers in the stomach and**

ERGOT

intestines may occur, because various areas of these organs are deprived of their circulation. **Ulcers of the cornea** of the eye may also result from the contraction of some of the small blood vessels leading to the cornea.

Nervous or Spasmodic Form

The symptoms of this form are believed to be due to spasms of the muscles in some of the small blood vessels of the brain. The contraction of some of these vessels obliterates the circulation in certain areas of the brain, thus causing the various symptoms. Some of the symptoms remain permanently.

Symptoms.—1. Weakness.

2. Drowsiness.

3. Headache.

4. Dizziness.

5. Itching, and a feeling as if something were creeping over the limbs (formication).

6. Temporary or partial blindness.

7. Painful cramps in the limbs.

8. Clonic convulsions, followed by epileptiform convulsions. The mind remains clear after the attacks, but often the patient becomes insane.

The treatment varies with the symptoms.

Uses

Ergot is used to contract the uterus, and to prevent or check uterine bleeding. It should always be given when the **uterus is empty**.

In labor cases it should always be given **after the third stage of labor**; that is, after the placenta is expelled. If given before the placenta is entirely expelled, the contractions of the uterus may cause pieces of the placenta to remain in the uterus, which may become infected and cause sepsis.

Ergot is frequently given to check bleeding from the lungs, from an ulcer of the stomach, from an ulcer of the intestines in typhoid fever, etc. The bleeding is checked by the contractions of the bleeding vessels.

Ergotoxine and tyramine are used to increase the blood pressure.

Administration

Ergot has a very unpleasant taste which should always be disguised. It is best given after meals.

When given hypodermically, it should be injected deep into the muscles, and the part should be massaged very thoroughly afterwards.

ERYSIPELAS

Preparations

Fluidextract of Ergot; dose 1 to 2 drams.

Wine of Ergot; dose 2 to 5 drams.

This contains about 20 per cent. of ergot.

Ergot preparations should always be fresh, as they change very readily and become inactive if kept for any length of time.

There are a number of preparations of ergot on the market which are suitable for hypodermic use. There are other preparations which are not so nauseating and are more reliable than the usual preparations. Most of them are not official.

Ergotoxine; dose $\frac{1}{100}$ to $\frac{1}{50}$ of a grain.

This is one of the active principles of ergot and is given hypodermically.

Ergotinine Citrate; dose $\frac{1}{100}$ to $\frac{1}{50}$ of a grain.

This is an alkaloid which is changed in the body to ergotoxine.

Tyramine; dose $1\frac{1}{2}$ grains.

This is one of the active alkaloids of ergot; it is used to contract the uterus and to increase the blood pressure.

Purified Extract of Ergot (Bonjean's Ergotin); dose 2 to 8 minims.

This is a purified extract of ergot about ten times as strong as ergot itself. It is often given hypodermically.

Ergotole; dose 5 to 30 minims.

This is an excellent preparation made from specially cultivated Spanish ergot. It is about $2\frac{1}{2}$ times as strong as the fluidextract. It is suitable for hypodermic use.

Ernutin; dose 30 to 60 minims.

This is a reliable preparation of ergot, which has a pleasant taste. It is given hypodermically in doses 5 to 10 minims.

Cornutol; dose, hypodermically, 10 to 30 minims; dose, by mouth, 10 to 60 minims.

See LABOR, MANAGEMENT OF.

ERYSIPELAS, NURSING IN

Erysipelas is caused by the entrance of the *Streptococcus erysipelatis* into an abrasion, cut or scratch of the skin. It is at first a spreading inflammation of the skin but may involve the deeper tissues and cause abscess formation. It is rarely fatal per se to adults but is apt to recur. Infants infected through the cord stump rarely survive.

Patients suffering from erysipelas should be isolated whether at home or in the hospital. Probably no disease is more dreaded in hospitals than erysipelas because of the disastrous results if it spreads through a surgical or maternity ward.

ERYSIPELAS

Strict isolation of the patient and assignment of a nurse who cares for no other case should be carried out with expediency. The nurse need not be isolated. All linens, dishes and utensils used in the care of the patient must be carefully disinfected and all dressings burned.

As erysipelas is a self-limited disease internal medication is of very little value except for the purpose of aiding elimination. Local applications of 1 : 5000 bichloride of mercury solution frequently gives much relief. A rather favorite application is Ichthyol ointment 1 : 4. If this is used the nurse must remember that its stain is exceedingly difficult to remove from linen and should request old linen for use for the patient. Iodine painted on the skin at the edge of the advancing infection is sometimes thought to prevent its spread.

Since the temperature is high and the pulse rate rapid from the onset of the disease to the temperature crisis the patient is kept in bed and as quiet as possible. If the infection is located on the face or arms, as frequently occurs, there will be much discomfort from the edema. As the eyes may be swollen and closed, a darkened room and cold compresses to the eyes will be found very soothing.

Careful bathing of such parts of the body as are not affected by the disease is important from the viewpoint of comfort and elimination. All matters tending to worry or annoy the patient should be guarded against for such patients are unusually prone to be irritable over trifles.

If albuminuria is present the protein content of the diet should be kept low and liquids forced. During convalescence the diet should be especially nourishing and well balanced since this is a disease which requires careful hygiene if a relapse is to be prevented.

With the fall of the temperature the other symptoms rapidly abate unless an abscess forms.

Before the patient is released he should receive a careful soap and water bath and shampoo, followed by bichloride of mercury solution 1:5000, wrapped in a clean sheet and taken to an adjoining room for clean clothing.

The room occupied by the patient must receive a most thorough disinfection. All blankets and pillows should be disinfected and sent to the laundry. The mattress should be sent to the autoclave or placed in direct sunshine for twelve hours. The walls and all woodwork in the room should be washed. Furniture should be washed and polished.

Nurses need not hesitate to care for an erysipelas case if they are careful to protect any scratch or abrasion of the skin. Any nurse specializing in obstetrical cases or waiting for one should not accept these cases. It should

ESCHAROTICS

be unnecessary to remind the nurse leaving an erysipelas case to be sure that she has a very careful shampoo and bath and complete change of clothing before she accepts another case.

ESCHAROTICS OR CAUSTICS

Escharotics are substances which produce destruction or death and sloughing of the tissues.

When an inflammatory process becomes sluggish or chronic, that is, when liquefaction and resolution are delayed and milder counterirritants fail to stimulate and shorten the process, sometimes harsher methods are resorted to in order to remove the unhealthy tissue and give the cells a chance to heal.

Action of Escharotics.—These agents cause so much tissue change that counterirritation is very prolonged. They are very irritating and penetrating and for this reason are not used extensively.

Escharotics are Applied for the following Purposes:—

1. To stimulate healing in small superficial areas, such as sluggish ulcers.
2. To destroy the poison, neutralize the effect and prevent the absorption of poison from dog bites or poisonous snake bites.
3. To remove warts, polypi, hypertrophied tissue and an over-production of granulations.

Escharotics Commonly Used:—1. Acids—sulphuric, nitric, salicylic, glacial acetic, carbolic.

2. Alkalies—potassium, sodium, and calcium hydroxide.

3. Metallic salts—silver nitrate (lunar caustic), copper sulphate (bluestone), zinc chloride, burnt alum and arsenious acid.

4. Carbon dioxide, liquid or solid.

5. Phenol or carbolic acid.

6. The cautery in actual contact with the tissue.

Method of Application.—Escharotics are applied in the form of a solution, ointment, or solid preparation. Care must always be taken that the application is made to the local area only and that the surrounding tissue is protected. In some cases, when the desired result has been obtained, the action of the caustic is checked by neutralizing it as in the use of alcohol following an application of carbolic acid.

ESERINE

See **PHYSOSTIGMA**.

ESOPHAGUS, BURNS OF

The esophagus may be burned by the passage through it of foreign substances. This will result in an ulceration,

ETHYLHYDROCUPREINE

with a contracture and stricture, making swallowing rather difficult.

Treatment.—If the esophagus has just been burned by acid, then alkali must be given in the form of a solution of sodium bicarbonate. If caustic alkali is the agent which has been ingested, then a diluted vinegar solution is given to neutralize the base. The stricture, resulting from the healing of the injured area of esophagus is treated by the passing of esophageal sounds, or bougies. These are passed at frequent intervals, the diameter of the bougie being increased in size until the esophagus has been dilated to normal. If the ulceration is very widespread, the dilatation of the esophagus is impractical, and because of its extensive nature, more radical procedures must be adopted.

The patient is unable to swallow; and as he cannot be nourished indefinitely by rectal enemata an opening must be made directly into the stomach. Through this fistula the food may be introduced and the patient receive the proper nourishment for his existence.

See GASTROSTOMY.

ESOPHAGUS, FOREIGN BODIES IN

It is very important to really ascertain that the patient has a foreign body, and the X-ray is a valuable aid in determining the presence of many varieties. Some of these may be removed by special instruments; for example, a coin-catcher, or by direct vision through an esophagoscope. If these bodies are of too great a size to be easily dislodged and are caught fast in the cervical region of the esophagus, the esophagus may be opened through the neck, and the object extracted. The operation is spoken of as esophagotomy. If the foreign body is close to the cardiac portion of the esophagus it may be removed indirectly via the stomach by a gastrostomy.

ETHER

See ANESTHETICS.

ETHYL BROMIDE

See ANESTHETICS.

ETHYL CARBAMATE

See URETHANE.

ETHYL CHLORIDE

See ANESTHETICS.

ETHYLHYDROCUPREINE (OPTOCHIN)

Optochin or **Ethylhydrocupreine** is a substance obtained from the bark of a Chinese plant. It is also made from

EUCAINE

hydroquinine, a substance made from quinine. Ethylhydrocupreine acts like quinine. It has, however, a specific destructive action on pneumococci, the bacteria which cause pneumonia. It has therefore been used in recent years as a specific for pneumonia.

It is applied locally in 1 per cent. solutions to local infections caused by the pneumococci, such as certain forms of corneal ulcers in the eye.

It is given in pneumonia as a specific. The treatment is begun by giving 8 grains as an initial dose, followed by $2\frac{1}{2}$ grains every 3 hours until 23 grains has been given in twenty-four hours. The best results are obtained when the drug is given early in the disease as otherwise the pneumococci become resistant to it. It is also given hypodermically in solution or in oil.

Poisonous Effects

Ethylhydrocupreine is particularly apt to cause poisonous symptoms, which are those of quinine poisoning. It is especially apt to cause eye symptoms, even blindness.

Preparation

Ethylhydrocupreine hydrochloride (optochin)

EUCAINE

Eucaine is an artificial alkaloid which is used as a local anesthetic. It produces local anesthesia, like cocaine. It differs from cocaine, however, in the following ways:

1. It does not contract the blood vessels.
2. It slows and weakens the contractions of the heart, by directly affecting the heart muscle, thereby causing a slow, weak pulse, with low blood pressure.
3. It does not dilate the pupil.

Administration

For local anesthesia in the eye, it is used in a $\frac{1}{2}$ per cent. solution. On other mucous membranes, it is applied in 2 to 10 per cent. solutions.

For infiltration anesthesia, it is used in a 1:500 to 1 per cent. solution.

Eucaine is not as poisonous as cocaine, and can be boiled.

It is also often used in the form of an ointment for painful hemorrhoids.

Preparations

Eucaine is called beta eucaine, to distinguish it from alpha eucaine which was formerly used as a local anesthetic, but because of dangerous symptoms which it produces has now been given up.

EXTRA-UTERINE PREGNANCY

Beta Eucaine Hydrochloride.

Beta Eucaine Lactate. This is more soluble than the hydrochloride salt.

And see COCAINE.

EUCALYPTOL

Eucalyptol is a substance obtained from the oil of eucalyptus and other volatile oils. The oil of eucalyptus is the active volatile oil of the **Eucalyptus globulus**, or **blue gum tree**, which grows in southern countries and has the peculiar quality of absorbing moisture from the soil. It is therefore used to drain swamps, and it helps to purify a malarial district in this way; since mosquitoes develop in swampy regions.

Eucalyptol produces the following effects:

1. **Locally**; it acts as an antiseptic and reddens the skin and mucous membranes.
2. **Internally**; it checks the growth of bacteria in the intestines and increases the secretions.
3. After absorption it increases all the secretions, such as the perspiration and bronchial mucus. It also makes the pulse stronger and faster.
4. It is used in the treatment of malaria, as an intestinal antiseptic, and is inhaled in lung abscesses and fetid bronchitis.

Preparations

Eucalyptol; dose 5 to 15 minims.

Oil of Eucalyptus; dose 5 to 15 minims.

EXOPHTHALMIC GOITER

See THYROID GLAND, DISEASES OF.

EXTRACTS

Extracts are solid preparations obtained by dissolving the drug in alcohol or water, and then evaporating the solution. The resulting sediment is the extract, and is usually about four or five times as strong as the crude drug itself.

EXTRA-UTERINE PREGNANCY (ECTOPIC GESTATION)

In some exceptional cases the fertilized ovum engrafts itself on some part other than the mucous membrane of the body of the uterus. Such a pregnancy is called "extra-uterine" or "ectopic." According to the situation we may have Abdominal, Ovarian, and Tubal pregnancy.

Signs and Symptoms.—A. *Before Abortion or Rupture.*—There may be no symptoms at all. The woman may not even be aware that she is pregnant. But in the majority of

EXTRA-UTERINE PREGNANCY

cases there are symptoms which, though slight in themselves, are, like preëclamptic symptoms, of enormous importance as warnings of an impending disaster.

In the first place, there may be symptoms of early pregnancy. If the pregnancy has existed for a sufficient length of time, there may be a history of one or more periods missed. In a number of cases, however, there is no amenorrhea, and in others it is masked by hemorrhage from another cause. In some cases the bladder symptoms of early pregnancy are exaggerated. The sickness and other reflex symptoms may also be severe.

In the second place, there may be symptoms special to the condition. These are two in number—hemorrhage and pain. The hemorrhage is due to contractions of the uterus squeezing the soft, unsupported decidua within it. It may occur as recurrent slight bleedings, but more usually it continues as a slight persistent brown or dark red discharge. In many cases it is looked on as menstruation or as symptomatic of a threatened or an incomplete uterine abortion, and the real cause is overlooked. Portions of the decidua may come away in this discharge, but this is not always the case. Still less is the passage of the entire decidua as a cast to be expected. Microscopic examination of decidual shreds may be of importance in the diagnosis from abortion, as the discovery of villi would indicate an intra-uterine pregnancy.

The pain is partly a referred peritoneal pain, due to congestion and stretching of the tube covering, partly a colic from contractions of the tube and uterus. It is sharp and colicky in nature, usually worst over the ovarian region on the affected side. Frequently it is accompanied by a feeling of faintness or nausea.

The physical signs on bimanual examination consist in the enlargement of the uterus, which is practically always present, and perhaps the softening of the cervix. At one side and rather behind the uterus is a swelling which is, in a typical case, rounded, rather elastic, pulsatile, and *usually tender*—the pregnant tube..

B. At the Time of Abortion or Rupture.—Clinically it is impossible to distinguish between rupture and tubal abortion. The patient is, without any warning, seized with severe cutting pain in the lower abdomen, and occasionally a feeling as of something having given way. This is immediately followed by severe collapse, fainting, deadly pallor, with a small, thready, frequent pulse. Death may ensue without any rallying, and before anything can be done. Physical examination of the pelvis immediately after the occurrence may reveal the same state of matters as before rupture.

EXTRA-UTERINE PREGNANCY

The presence of free blood in the pouch of Douglas cannot be made out, but some hours later, when the blood has clotted, it may be felt as a doughy, semi-solid mass filling up the pelvis behind and to the sides of the uterus—a pelvic hematocele.

In some cases the symptoms are less sudden and less severe. In them it is usually found that there has been an incomplete tubal abortion, and that the blood has formed a large clot encysted in a fibrinous covering around the mouth of the tube—a peritubal hematocele. Such cases are more favorable than those in which there is a sudden outpouring of blood into the abdominal cavity.

Diagnosis.—This may be a matter of great difficulty. A very careful study of the history should be made, as well as a careful and *gentle* bimanual examination—under an anesthetic if necessary. The condition may be mistaken for a small ovarian cyst with or without a coexisting pregnancy, for a fibroid tumor, or for a hydrosalpinx, or even a pyosalpinx. In all of these the history is generally different. Much more commonly, and with much graver results, the condition is confused with (1) uterine abortion, and (2) retroversion of the gravid uterus.

Uterine Abortion.—This condition and an early tubal pregnancy may have every symptom in common—signs and symptoms of early pregnancy, pain, hemorrhage either irregular or as a continuous brown discharge, passage of shreds of decidua, enlargement and softening of the uterus. Careful examination will reveal the tubal swelling. The detection of villi in the decidual shreds proves a uterine pregnancy, but their absence proves nothing.

Retroversion of the gravid uterus is most likely to be confused with tubal pregnancy after rupture and the formation of a hematocele in the pouch of Douglas. In both cases there is the history of early pregnancy and the softening of the cervix. Behind the uterus there is an elastic swelling in both cases—the body of the uterus in the one, the hematocele in the other. Even before rupture the mistake may be made, the tubal swelling being taken for the retroflexed body. Careful bimanual examination will reveal the true condition.

Diagnosis of Rupture.—Unless the history indicates the condition, it may be impossible to make a more accurate diagnosis than that of internal hemorrhage from the rupture of an abdominal organ. The rupture of a gastric ulcer or of the appendix may thus be mistaken for it, or *vice versa*. Torsion of the pedicle of an ovarian cyst may also be mistaken for the condition.

Happily the treatment in each case is the same—to open

EYE NURSING

the abdomen, find out the exact state of matters, and deal with it.

Prognosis.—As long as an extra-uterine gestation continues the prognosis is very grave, for at any moment a rupture may occur which may easily prove fatal. The risk of operation on an unruptured early pregnancy is slight in the hands of competent operators.

If rupture or abortion has occurred, the gravity of the prognosis varies with the severity of the symptoms and the promptitude with which skilled treatment can be obtained. Even under the best circumstances the prognosis must be very guarded.

Treatment.—A tubal pregnancy diagnosed before rupture should be removed by abdominal section at the earliest possible moment. After rupture has occurred the only treatment is still removal of the tube. The abdomen should be opened without delay, the bleeding points secured, and the tube removed. Recovery sometimes follows the operation in cases that appeared quite hopeless, and it may therefore be said that it is never too late to operate in this condition. So far as the operator is concerned, success probably depends on making the operation as brief as is consistent with efficiency, and on combating the shock and collapse.

Treatment of a tubal pregnancy that has gone beyond the early months—almost always a secondary abdominal pregnancy—is a very difficult matter, and very dangerous, owing to the probability that the placenta has made extensive vascular connections with the intestines or other organs. At a varying time after the death of the fetus the placenta becomes thrombosed; it may therefore be safer to leave the case to go to term when a spurious labor will ensue and the child die. This apparent neglect of the fetal life is justifiable owing to the serious risk to the mother of interference during the child's life, and to the fact that even full-time children in such circumstances are usually deformed and rarely survive. Some weeks after the spurious labor the abdomen may be opened, and the sac and its contents removed as far as possible. It is usually necessary to leave some of the sac, stitching it to the abdominal wound, and packing it. Convalescence in such circumstances is at the best tedious.

EYE NURSING

One of the first and most important duties that should be impressed upon a nurse in the care of eye cases is that of perfect asepsis. The carrying out of rigid technique enters largely into the duties of a nurse doing eye nursing.

Method and Articles Necessary for Cleansing an Eye:

EYE NURSING

A 2 per cent. solution of boric acid, temperature 100° F., sterile cotton, a kidney basin to catch the solution, a sterile towel, and small rubber bulb syringe, should be sterilized for cleansing an eye.

The Method Employed in Cleansing an Eye:—The nurse's hands should be sterile, the patient should be in a reclining position with the infected eye down and the irrigation done from the inner angle to the outer angle of the eye, thus avoiding the entrance of infected secretions into the well eye. Gently wipe the eye after irrigation with a sterile cotton ball. A Buller's shield made from a watch crystal is a good method for protecting the well eye. A troublesome child should be swathed. If both eyes are infected separate utensils are necessary.

Application of Drops:—In applying drops to the eyes the best method is to draw the lower lid with a finger of the left hand, directing the patient to look upward. With the dropper in the right hand allow a drop to fall upon the inner surface of the lid. This is an agreeable method for the patient with a sensitive cornea. In instilling drops the point of the dropper should never be allowed to come in contact with the lids or eyeball.

Care of Bottles and Solutions:—Bottles and droppers are cleansed by washing in soap-suds, and if there is any deposits in bottles or pipets use hydrochloric acid 1:3 or 1:6, being careful to thoroughly rinse the bottles and droppers. The rubbers are removed from the droppers. Sterilize by boiling or soaking in bichloride of mercury (1:500) over night.

Solutions are made from distilled water and ready for use. The action of atropine and cocaine is changed by heat. The action of light affects other drugs. Thus eserine is changed to a pink tint, cocaine to a blue tinge.

All contagious eye cases should have complete isolation.

Bandaging an Eye:—This subject is important. An inflamed eye should rarely be bandaged. It renders the eye hot and retains the discharges in the conjunctival sac. A popular method used is the figure-of-eight bandage in eye cases. See **BANDAGING**.

Preparation and Post-operative care of a Cataract Case.—

1. Urine examined, if over 3 years of age, or younger if it can be obtained.
2. Cleansing bath.
3. Enema, if necessary.
4. Have vision and field taken, and eye carefully examined.
5. Semi-solid lunch if the operation is to be done in the afternoon.

EYES, GLASS

If ordered to cleanse the surrounding area, wash with soap and water, and cleanse with 1:10,000 bichloride of mercury, then with sterile water. Flush the eye with a boric solution.

How to Cocainize an Eye:—Cocaine 4 per cent. every 5 minutes for 6 doses to be instilled in the eye $\frac{1}{2}$ hour before operation. While cocainizing, keep the eye covered with Knapp's dressing. Instruct patient not to squeeze his eyes, and what to do after operation. If operation is on a woman, braid the hair on top of head, leaving space for bandage to pass above ear.

First night, liquids, then semi-solid diet while in bed. Usually after twenty-four hours patients are allowed to be turned on opposite side from operation to rest the back. No cathartic for the first four days after operation, unless ordered.

Dressing Tray for Cataract Operation:—For the dressing of cataract cases a tray is prepared containing bowls of warm boric acid solutions, absorbent cotton balls, Knapp's dressings, bandages, a condensing lens, solutions of cocaine, atropine, eserine, argyrol, and a receptacle for soiled sponges and bandages.

Foreign Body in the Eye.—Pull down lower lid and if the substance can be seen remove it with the pointed corner of a handkerchief. When it is beneath the upper lid, draw the upper lid out and push the lower lid up under it. The substance may then attach itself to the eyelashes on the lower lid. When any foreign body is firmly attached in the eyeball, place wet gauze or a wet handkerchief loosely over the eye and hold it on with a very light bandage until patient can be taken to a physician.

It is always safe and generally successful to try to remove a foreign body by washing the eye out carefully (using weak salt and water, boracic acid solution or plain water) and as the fluid goes over the surface, hold the lid out from the eye and direct the patient to move the eyeball up and down.

EYES, ARTIFICIAL, OR GLASS

See GLASS EYES.

F

FAINTING

Cause.—Loss of blood to the brain due to some disturbance in the circulation.

Symptoms.—White face, feeble pulse, shallow breathing, giddiness to unconsciousness.

Treatment.—Send blood to the brain by placing the patient in a lying-down position, and if possible with the head lower than the heart or if unable to do this, bend the head down over the knees. Provide free circulation of fresh air for the effect of **oxygen** on the blood—make a crowd stand aside—loosen any tight clothing—especially at the neck. Smelling salts may be used for inhaling—holding it so as not to spill the fluid. Ammonia or aromatic spirits of ammonia can be sprinkled on a handkerchief and held to the nose likewise. When the patient becomes conscious, a stimulant may be given of aromatic spirits of ammonia (half a teaspoonful to 1 ounce of water), or alcohol (such as whiskey: 1 to 2 tablespoonfuls to $\frac{2}{3}$ as much hot water; or a little sherry). For some time afterwards, keep the patient lying down, quiet, and warm.

FALLOPIAN TUBES, DISEASES OF

Any inflammation of the Fallopian tubes is spoken of as **salpingitis**. It may be acute or chronic.

Acute Salpingitis.—This may be due to an infection occurring during labor, from unclean instruments, much instrumentation, or a preëxisting gonorrheal infection. The history usually given is that of a vaginal discharge, abdominal pain of a colicky nature and, in addition, the history of a recent labor, instrumentation, or gonorrhea.

Treatment.—The treatment consists of absolute rest in bed in the Fowler's position. Hot vaginal douches are given every six to twelve hours, depending upon the severity of the inflammation. Applications are made to the lower abdomen, either in the form of heat or cold, and movements of the bowels should be assured by enemas. If the pain is very severe, sedatives may be given. Very often these cases of tubal infection are complicated by pelvic peritonitis

FECES

resulting in the development of a pelvic abscess. Instead of draining this through the abdomen, the abscess may often be drained through the vagina by making an incision between the posterior part of the cervix and the posterior wall of the vagina. This is known as a *colpotomy*. A good sized drainage tube is introduced into the abscess cavity, but because of the dependent position, the drainage tube will not stay in place without some special arrangement of a cross piece, so as to make a "T" tube. Great care should be taken that the vagina is kept scrupulously clean, and the drainage free. In order to accomplish this, vaginal irrigations with normal saline solution should be given twice a day.

Chronic Salpingitis.—This may be a sequela of acute salpingitis. The tube may either be bound down with fibrous adhesions, or it may be dilated and filled with watery material (*hydrosalpinx*); or it may be filled with pus (*pyosalpinx*). Occasionally it may be tuberculous.

Symptoms and Treatment.—The symptoms are backache, pain in the lower abdomen, menstrual disturbances, weakness, and vaginal discharge. Physical examination may reveal a mass in the pelvis. If the case is adjudged favorable for operation, a low laparotomy is performed with the excision of the affected tube (*salpingectomy*). There are no special ante-operative or post-operative measures other than those which have been outlined in all other abdominal operations.

FECES

What to Observe about the Feces.—The principal points to be observed in regard to the stools are the number of movements in twenty-four hours, and whether accompanied by pain or straining; the consistency, shape, color, and odor of the stool, and the presence of unusual matter (such as blood, pus, mucus, worms, etc.). The expulsion of gas or flatus should always be noted.

FEEBLEMINDEDNESS

See MENTAL DEFICIENCY.

FERRUM

See IRON.

FETAL SKULL

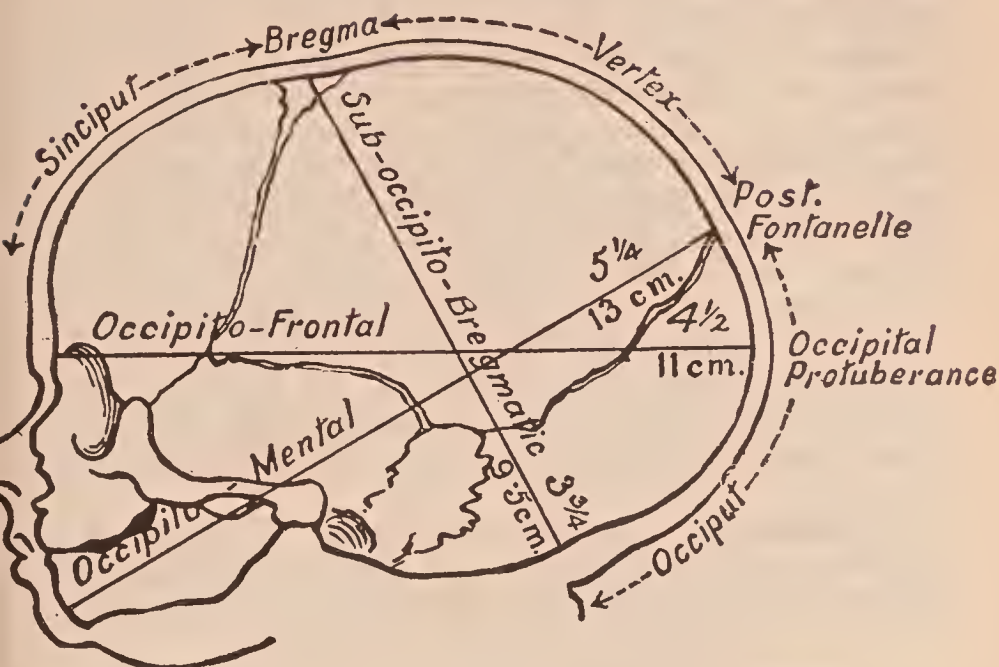
Diameters of the Fetal Skull

Suboccipito-bregmatic	3¾ inches (9.4 cm.)
Occipito-frontal	4½ inches (11.25 cm.)
Occipito-mental	5¼ inches (13 cm.)
Biparietal	3¾ inches (9.4 cm.)
Bitemporal	3¾ inches (8 cm.)

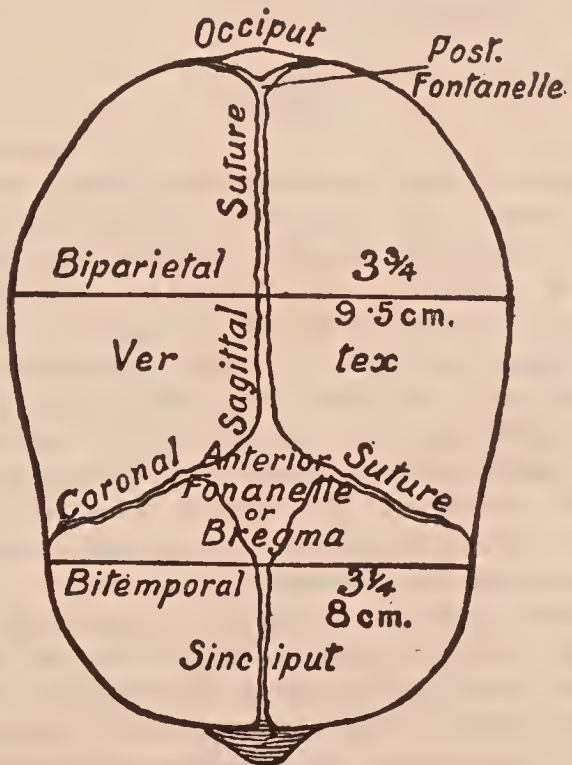
FETAL SKULL

Circumferences

Suboccipito-bregmatic	.....11	inches (27.5 cm.)
Occipito-frontal	.....13½	inches (34 cm.)
Occipito-mental	.....15	inches (37.5 cm.)



Fetal skull. Regions and diameters.



Fetal skull, seen from above.
 (From Johnstone's Textbook of Midwifery)
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FETUS, DEATH OF

FETUS, DEATH OF

Diagnosis of the Life or Death of the Fetus.—The only positive indications of the life of the fetus are the heart-beat and active movements. Its life should, however, always be assumed until its death can be diagnosed with reasonable certainty. In the early months this can only be done by noting on repeated examinations that the uterus remains stationary in regard to growth, and that the breasts either cease enlarging or grow smaller again. In the later months, when once the heart-sounds have been heard or the movements felt, their absence on repeated examination is very suspicious. Very often the mother experiences after the death of the child some vague symptoms of heaviness, languor, a feeling of coldness, and the like. If with these there is retrogression of the breast conditions, the diagnosis is fairly certain. An offensive brown discharge, or the palpation of a macerated fetus through the cervix, puts the matter beyond doubt.

Treatment.—A dead fetus is a source of danger, as the mother is very liable to septic infection. A physician should be called; he will remove the dead fetus and the membranes.

FETUS, PRESENTATION AND POSITION OF

See PRESENTATION and POSITION.

FEVER

Fever begins in one of two ways. The *onset* or *invasion* (the period when the temperature is rising) may be very *sudden* and violent, as in pneumonia and scarlet fever. The temperature rises very abruptly, usually accompanied by a chill or in a child by a convulsion (an exaggerated chill), or it may be a *gradual* onset, as in typhoid. The temperature rises higher each day, reaching its maximum in two or more days, and the other symptoms, headache and back-ache, etc., become more severe. After the temperature has reached its maximum it usually remains high, though there may be wide variations, for from a few days to two or three weeks. This period of more or less constantly high fever is called the *fastigium* or *stadium*.

The fever will also *subside* in one of two ways. Like the onset, it may be very *sudden and abrupt*, the temperature falling 4 or 5 degrees within a few hours, and reaching to or below normal in from 12 to 24 hours, accompanied by a marked improvement in the patient's condition—the breathing and pulse become more normal in rate and character, the patient falls into a sound sleep from which he awakens

FEVER

refreshed, with mind clear, a new being, normal but very weak. Sweating and the voiding of an increased volume of urine usually occur during this period. This is called the *crisis*, and it occurs in pneumonia, malaria, and scarlet fever, etc. The crisis is a very critical period, the outcome being almost certain recovery or probable death, so the patient must be watched very closely. He may go into collapse and die.

The fever may subside very *gradually*, as in typhoid, the temperature falling step by step in a zigzag manner for two or three days or a week before reaching normal, during which time the other symptoms also gradually disappear. The fever is then said to subside by *lysis*.

Types of Fever.—Fever in different diseases run a characteristic course and are classified as “constant,” “remittent,” and “intermittent” according to the diurnal variations. For instance, in pneumonia the temperature remains constantly high with only a slight (not more than 2° F.) variation between the morning and evening temperatures. This is a “constant” or “continuous” fever. Sudden changes during a “constant” fever usually indicate complications. If the fever is extensively prolonged, it also usually indicates complications, frequently tuberculosis.

The temperature curve in septic fever, remittent fever, and during the invasion and lysis in typhoid, shows a variation of more than 2° F. and usually not less than 3° F. between the morning and evening temperatures, the lowest point, however, never reaching normal. This is called a “remittent fever.”

In “intermittent fever” a sudden rise of temperature is followed by a sudden fall to or below normal, the fall usually being accompanied by profuse sweating. This alternate rise and fall of temperature may occur daily or after the lapse of a regular number of days, as in tertian malaria. The fever accompanying septic conditions, such as advanced tuberculosis, septicemia, and pyemia, is frequently “intermittent,” but may be “remittent.” A prolonged “intermittent” fever such as in advanced tuberculosis is frequently described as “hectic.”

During convalescence from fevers there may be a recrudescence or recurrence. The elevation in temperature, etc., may be merely temporary, due to excitement as from the visit of friends, to overfeeding or the first solid food, to constipation, or to some unusual exertion, such as sitting up in bed, or to similar causes. Such a recurrence, however, should receive the most careful attention as it may mean a true relapse of the previous disease which must again run its course, or it may indicate complications.

FIBROIDS

See UTERUS.

FIBROIDS

FILMARON

See MALE FERN.

FISTULA IN ANO

See ISCHIO-RECTAL ABSCESS.

FITS

See CONVULSIONS.

FLAXSEED

See LINSÉED.

FLEAS

See LICE.

FLIES

The fly that causes intestinal diseases in this zone is chiefly *musca domestica*, the house fly. It is distinguished from the stable fly, which latter bites, most readily by observing that the house fly has depending from its head and enlarging towards its lower end, a proboscis, or trunk, which it lets down upon its food. The domestic fly has had all sorts of evil names thrown at it, but its chief really serious accomplishment against human happiness is achieved by carrying to food from outdoor toilets or open-air deposits of human feces, infectious disease germs, chiefly those of typhoid or dysentery. While, doubtless, the fly may carry tubercle bacilli from tuberculosis sputum, diphtheria from infected discharges on pillows, etc., the fly is not an important factor in any but the intestinal diseases, since in the others its effects are quite overshadowed by the much more serious methods of transfer, mouth-spray and hands, which, moreover, operate between meals and in winter as well as summer.

House flies carry infection on their feet and also in their intestines, the contents of which they deposit everywhere as fly-specks. These fly-specks are in part fecal, but the great majority are the result of a regurgitation or vomiting of intestinal contents.

Flies breed by preference in horse manure, hence, about stables; cow manure seems to be their next choice. Garbage will often show maggots, but there is not much chance

FOMENTATIONS

that flies will develop from such maggots, if the garbage is in a pail, for at a certain stage it seems necessary for the prospective fly to enter dry soil for a time, and it cannot well do this through a pail bottom. Every one must have noticed how thick flies are in dry summers, how few in wet summers: exactly the converse of the conditions favorable to mosquitoes.

To keep flies out of a house is very difficult unless there is perfect screening of every door and window and unless the screens are kept continually closed, which they never are, especially if children or careless adults use the screen doors. Once flies are admitted, the screens prevent their exit, and flies so trapped must be "swatted," caught with flypaper, or poisoned. (Formalin, 1 in 40 of water, disposed in saucers where the flies will drink it, is quite efficient.)

The most practical procedure, not to get rid of flies, but to make them relatively harmless, consists in so screening and otherwise protecting outdoor toilets that flies cannot get to the excrement within. Half an hour's work expended on an ordinary outdoor toilet is sufficient to make it safe. The rules are simple—see that no unscreened opening is left from the vault to the open air; screen all necessary openings from the vault that communicate with the open air, such as windows, vent pipes, air holes, etc., and permanently close all others, except the door; on the door use a door-spring or, even better, a rope-brick-pulley device to insure that the door of the closet is not left standing open.

FLUIDEXTRACTS

Fluidextracts are concentrated fluid preparations of drugs made by dissolving the crude plant drug in the fluid in which it dissolves most readily. The strength and character of the fluid used therefore varies with each drug, and may be 95 per cent. alcohol, alcohol and glycerin, or dilute alcohol of various strength. Fluidextracts, however, are always 100 per cent. in strength; that is, 1 minim contains 1 grain and 1.0 c.c. contains 1.0 gm. of drug.

FOMENTATIONS

The **fomentation** is a clean, efficient, and economical method of applying moist heat by means of two or more thicknesses of flannel cloth or old blanket wrung as dry as possible out of boiling water and applied directly to the skin a number of times in succession. The heat and moisture are retained by covering the application with a piece of dry

FOMENTATIONS

flannel and rubber tissue or oiled muslin. It is essentially a local vapor bath.

Fomentations are Used as a Therapeutic Measure:—

(1) To relieve pain and congestion in the adjoining parts by their analgesic or pain-relieving effect on the nerve endings, and by mechanically drawing blood from the congested part to the skin. They are used for this purpose in strains or sprains.

(2) To relieve pain and congestion in internal organs by their analgesic effect on nerve endings, by reflex action, and by drawing blood to the skin.

(3) To relieve distention or tympanites in pneumonia, typhoid, peritonitis and post-operative cases by causing the contraction of the smooth muscles of the intestines and the expulsion of the gas.

(4) To relieve intestinal and renal colic.

(5) To reduce a swelling; to stimulate the absorption of effusions or exudates; to increase the local blood supply, promote leucocytosis and functional activity.

(6) To accumulate heat and raise the temperature of the part.

Method of Procedure.—The essential factors to be considered in making the application in order to obtain the desired results are:

1. *The Preparation of the Patient.*—It is important to see that the patient is protected from exposure and chilling. Some doctors advise that during the treatment cold applications should be made to the head, particularly if there is any tendency to congestion of blood in the head.

2. *The Area to be Covered.*—This depends upon the object:

(a) When the object is to cause an increased volume of blood in the skin and relieve congestion in the adjoining parts or internal organs, the fomentations must be *very large* so as to withdraw a large volume of blood.

(b) When applied for a purely local effect, as in the relief of an infected finger or boil, etc., the application *should not be larger than necessary*, in order to avoid dilating the artery supplying the part and thus increasing the congestion.

3. *The solution* most commonly used is plain boiling water. Turpentine is frequently added to abdominal stupes as an added irritant for the relief of distention, etc. It is *never used* for fomentations applied for the relief of pain or congestion of the kidneys and suppression because the turpentine if absorbed would have to be eliminated by the kidneys, and, as it is very irritating, would aggravate the already inflamed condition.

FOOD

4. The *applications* are made by immersing soft pieces of flannel (the required size) in the boiling water until thoroughly saturated, then wringing them as dry as possible and applying directly to the skin.

When *turpentine stupes* are ordered, the turpentine may be added to the boiling water in the proportions of 3 teaspoonfuls of turpentine to 3 pints of boiling water. The water is allowed to boil freely again before immersing the flannel. Another method of applying turpentine stupes is to thoroughly mix one part of turpentine to two or three parts of olive oil for adults, and one to six or ten for children. Apply this before every second or third fomentation or as often as the skin will allow.

5. The *temperature* of the application will vary from 140° to 160° F. They are applied as hot as the patient can stand, that is, hot enough to cause pain when first applied.

6. *The Care of the Skin and Protection of the Part.*—The greatest care must be taken to prevent the skin from being burned. Wring the flannel as dry as possible. Apply it gradually and, if it causes too much pain, lift it up for a second and then replace it so that the skin may become gradually used to the extreme temperature. Oil the skin if tender, or if applications are made frequently. This prevents burning or softening of the skin. Take special care in distention, when the skin is apt to be stretched, also when the part is paralyzed, insensitive or benumbed by cold—it is safer to apply the fomentations at a lower temperature or to use plenty of vaseline.

7. After the removal of the last hot compress, dry the part and leave it covered with the soft, dry, warm flannel to prevent chilling, but do not have it sufficiently warm to cause perspiration. Oil the skin if very red or tender.

FOOD

Food Materials.—Food is the name given to any substance which, taken into the body, is capable of performing one or more of the following functions:

(1) Building and repairing tissue, maintenance, growth, and development of the muscles, bones, nerves, and the blood.

(2) Furnishing the energy for the internal and external work of the body.

(3) Regulating the body processes, maintaining the proper alkalinity and acidity of the various fluids throughout the body, regulating the proper degree of temperature, and determining the osmotic pressure, etc.

FOOD

The Sources from which the Chief Classes of Foods Are Drawn

Proteins . . .	{	Milk, cheese (especially skim-milk cheeses).
		Eggs.
		Meat (lean meat in particular).
		Poultry, game.
		Fish.
		Cereals, corn, wheat, rye, oats, etc.
		Bread and breadstuffs (crackers, pastry, macaroni, cake).
		Beans, peas, lentils.
		Cotton seed.
		Nuts.
Carbohydrates	{	Gelatin.
		Wheat products (bread, cake, crackers, pastry, macaroni, spaghetti).
		Cereal grains, breakfast foods.
		Corn products, corn meal, green corn.
		Rice, sago, tapioca, taro.
		Potatoes (white and sweet).
		Starchy fruits (bananas).
		Sweet fruits (oranges, grapes, pineapples).
		Dried fruits (prunes, dates, raisins, currants).
		Sugar cane, sorghum cane.
Fats	{	Sugar beets, sugar maples.
		Products made from sugar (candy, jellies, preserves, marmalade).
		Butter, cream, cheese.
		Olive oil, cotton seed oil, peanut oil, corn oil, almond oil.
		Soy bean.
		Corn meal, cotton seed meal and flour, oatmeal.
		Pork (bacon especially), other fat meat.
		Codfish (and other fatty fish).
		Eggs (yolk).
		Cocoanut, chocolate.
	{	Brazil nuts, almonds, pecans, and other nuts rich in fat.

The approximate fuel value of the food constituents is given as:

Proteins	4 calories per gram
Carbohydrates	9 calories per gram
Fats	4 calories per gram

FOOD

A **calorie** is defined as “the amount of heat required to raise the temperature of one kilogram of water one degree Centigrade (or about four pounds of water two degrees Fahrenheit).

The Food Requirements of the Body.—The human body does not use one nutrient to the exclusion of another; the best results are obtained from diets balanced to suit the needs of the body, providing the fuel and repair materials in the amounts which are calculated to give the maximum value with the minimum expenditure on the part of the organism. The investigators have endeavored to standardize the food requirements of the body. In France Gautier recommends the following standards for men with little muscular work:

- Protein107 grams
- Fat 65 grams
- Carbohydrates407 grams

In England Playfair recommends the following standard for men of moderate activity:

- Protein119 grams
- Fat 51 grams
- Carbohydrates531 grams

In Germany the standard suggested by Voit for men at moderate muscular work is:

- Protein118 grams
- Fat 56 grams
- Carbohydrates500 grams

Atwater’s standards for American dietaries are more liberal than any of the others. He has suggested “that the standard must vary not only with the conditions of activity and environment, but also with the nutritive plane at which the body is maintained.”

Atwater’s Standard for Men and Women with Varying Muscular Activities

	<i>Protein Grams</i>	<i>Fuel Value Calories</i>
Man with hard muscular work.....	150	4150
Man with moderately active muscular work	125	3400
Man at sedentary or woman with moderately active work.....	100	2700
Man without muscular exercise or woman with light to moderate work.	90	2450

FOOD

Preparation of Food

The various methods to which food is subjected in preparation for human consumption may be summed up as follows: boiling, simmering, steaming, baking, roasting, broiling, frying, sautéing.

Boiling is cooking in water raised to the boiling point, 212° F. (sterilizing). This method is commonly used in the cooking of starchy vegetables and cereals, and in the cooking of green vegetables, such as spinach, carrots, beets, corn, asparagus, etc. Stewing is a form of boiling. As a rule water is used, and the vessel is left uncovered, so that as the food is cooked the surplus moisture evaporates, leaving the food tender. Dried fruits, such as prunes and apricots, are prepared by this method.

Simmering is cooking in water, the temperature of which is not raised to the boiling point, but kept between 200° F. and 210° F. This method is used in the preparation of eggs and dishes in which eggs predominate, since proteins are made tough if subjected to a high degree of temperature. Coddled eggs, for example, are prepared by placing the egg in a clean vessel and pouring over it the boiling water, then covering the vessel and allowing it to stand for ten or fifteen minutes. The vessel and the cold egg reduce the temperature of the water to about 185° or 190° F. and in this way prevent a toughening of the albumen of which eggs are chiefly composed. Soups, broths, ragouts, etc., are prepared by this method.

Steaming is cooking over hot water or by steam. This method may be accomplished on the top of the stove in a "double boiler" or in the oven in a deep covered pan fitted with a "rack" to hold the article to be cooked. Either method allows the vessel in which the food is placed to be surrounded by boiling water, but does not insure sufficient heat to raise the food within to the boiling point.

Baking and roasting are both brought about in the oven. Bread, biscuits, pies and other pastry, potatoes, cakes, etc., are baked, while meats, roast of beef, lamb, veal, mutton, as well as chicken, turkey, duck, and large fish are roasted. The heat in the oven may be intense. The outside or cut surface of the meat is seared, the soluble albumens are coagulated, thus sealing the juices within. If the meat is placed in a pan surrounded by cold water and then placed in the oven, the juices are "drawn out" in the water. These juices contain the flavoring matter or extractives. Meat so treated is not so palatable or highly flavored as that which has first been subjected to intense heat, the water for the gravy added later.

FORMALDEHYDE

Frying and sauteing is cooking in hot fat. Food may be fried in deep fat, as is demonstrated in the cooking of croquettes, doughnuts, etc., or it may be sautéed in butter or oil in a shallow frying pan or griddle. The latter method is used in making hashed brown potatoes, for example; also in the frying of griddle cakes, etc.

Broiling.—In broiling or grilling the article to be cooked is exposed to direct heat, either to the blaze or to a very hot surface. The result is the same as in roasting. The outer surface is seared, sealing the juices within. Meat to be broiled is generally cut thinner than that to be roasted. The article, whether it is meat (steak or chops), birds, or chicken, is placed about three inches away from the flames and turned frequently until the surfaces are seared, after which the article is placed in a cooler part of the stove to allow the interior to be cooked. Pan broiling is done on top of the stove. The article to be broiled is placed directly upon a very hot surface, there is no grease used and the meat must be turned frequently to prevent burning.

Poaching.—This term is applied chiefly to the cooking of eggs in a shallow pan of water heated just below the boiling point. To be properly poached an egg must be perfectly fresh, or the white and yolk will run together and present an unappetizing, unpalatable appearance.

FOREIGN BODIES

See EAR, ESOPHAGUS, EYE, LARYNX, NOSE, THROAT.

FORMALDEHYDE

Formaldehyde is a gas obtained by oxidizing wood alcohol. A solution containing 40 per cent. of formaldehyde gas is called **formalin**.

Antiseptic Action: Formaldehyde gas vigorously destroys bacteria (germicide) and checks their growth (antiseptic). It also neutralizes unpleasant odors (deodorant).

Local action: Applied to the skin or mucous membranes, formalin hardens the tissues and checks the growth of bacteria on the surface. When formaldehyde gas is inhaled, it causes stinging and prickling sensations in the nose, with a profuse flow of mucus from the nose, a flow of tears from the eyes, secretion of saliva, and excessive coughing, with profuse expectoration.

Internal Action: Very small doses of formalin, when given internally, cause nausea and vomiting, lessen the digestion of food and make the pulse somewhat slower and weaker.

FORMALIN

Poisonous Effects

Poisoning by large doses of formalin or formaldehyde gas occurs occasionally, and produces the following **symptoms**:

1. Nausea and vomiting.
 2. Diarrhea.
 3. Shortness of breath and cyanosis (due to contracting the red blood cells and the formation of hematin in the blood).
 4. Collapse, coma, convulsions and death.
- The best **antidote** is ammonia water.

Uses

Formaldehyde gas is used principally to fumigate rooms and to disinfect clothing. It is generated in the following ways:

1. By heating a solution of formalin in the room; 150 c.c. of formalin are necessary to disinfect a room of 1000 cubic feet of space.
2. By heating paraform, a solid substance which liberates formaldehyde gas. There are numerous lamps on the market which liberate formaldehyde gas in this way.
3. By a specially constructed apparatus for generating formaldehyde gas. The gas is allowed to enter the room through a rubber tube which is inserted in the key-hole.

When disinfecting with formaldehyde gas, the cracks in the door should be stuffed with cotton and the room should be kept closed for 24 hours. The unpleasant odor is removed by sprinkling ammonia water about the room.

Formalin is used in 1:200 solutions to sterilize instruments. There are a number of instrument sterilizers on the market which generate formaldehyde gas and sterilize the instruments in this way. Formalin has also been used as a mouth wash and as a douche in 1:500 to 1:1000 solutions.

It is occasionally used as a preservative for milk and other foods. A 4 per cent. solution of formalin is used to preserve tissues for microscopic examination.

Preparations

Formalin (Liquor Formaldehydi)

This contains 37 per cent. of formaldehyde gas.

Paraform or Paraformaldehyde; dose 5 to 15 grains.

This is a solid substance which liberates formaldehyde gas on heating. It is used locally to destroy warts, and also internally as an antiseptic.

FORMALIN

See FORMALDEHYDE.

FRACTURES

FOTHERGILL'S PILL

See SQUILL.

FOWLER'S SOLUTION

See ARSENIC.

FRACTURES

A **fracture** may be described as a break in the continuity of a bone. While this condition is treated in the main by the surgeon, it affords great opportunity for the nurse to exhibit her skill not only in preparing the necessary things for the treatment of the fracture itself, but even more by conscientiously attending to those details that bring comfort to the patient. A fracture may be *simple*, that is, only involving the bone, or it may be *compound*, in which case the skin and deeper tissues as well as the bone have been injured. Compound fractures are serious and dangerous because the broken skin affords excellent opportunity for the various pathogenic organisms to enter and cause bone infection. For the present, however, our attention will be confined to simple fractures, those in which the skin is not directly injured, although it may be swollen, black and blue, and very tender to the touch.

Simple Fractures.—The aim in all fractures is to restore the bone fragments as near to their anatomical condition as possible, and after this has been accomplished, the next thing to do is to keep the fragments in their reduced position. The first process is usually spoken of as “reduction,” and the second process as “immobilization.”

Reduction of Fractures.—Fractures are reduced as a rule under general anesthesia, either gas, gas and oxygen, or ether. This is done because it is less painful, the patient is easier to control and the muscles are completely relaxed instead of being in a condition of spasm. Attempts at reductions are done by the surgeon as soon as possible after the injury.

Immobilization of Fractures.—Immobilization (the means of keeping fractures at absolute rest) has for its ultimate aim the healing of the divided bone ends by the growth of new tissue or “callus formation.” There are many methods designed to hold fractures in apposition. They may be classified as follows: (1) bandages, (2) strappings, (3) splints (wood, wire and plaster), (4) extension and traction appliances, (5) mechanical means applied through open operation.

It is a general rule in all fractures that the limb affected should always be placed in a position to favor the complete relaxation of the muscles which would have a tendency to

FRACTURES

pull the fragments apart, and, since the longer fragment can always be more easily controlled, it should be made to follow the position attained by the shorter fragment.

Bandages and Strappings.—While bandages are employed more in sprains and dislocations, they are occasionally used in certain fractures. Fractures of the jaw are very often controlled by a simple four-tailed bandage; a fracture of the clavicle may be kept in position by a Velpeau bandage or strapping. Both the four-tailed and the Velpeau bandages are described under **BANDAGING**.

Strapping for Fractures.—This is used most frequently when one or more ribs are broken. It forms an efficient method for immobilizing the chest, at the same time permitting the fractured ribs to heal. It should be emphasized that the adhesive plaster dressing should never be directly applied over the area of fracture, with the exception of fractured ribs, because, with the swelling of the limb and the pressure of the adhesive, an ulceration of the skin is apt to ensue. The result is that a clean fracture may be converted into a compound one. Another rule in the application of adhesive dressings is that the part over which the adhesive is to be applied should be shaven of all hair.

Splints.—"A splint is an apparatus for preventing movement of a joint, or between the ends of a broken bone." Since materials used for splints must of necessity be hard, firm and unyielding, they should always be padded well. There is nothing more distressing than to see a patient with a simple fracture of the radius just above the wrist in which the splint was not only insufficiently padded but was applied too tightly. The result is a forearm which has become blistered, ulcerated and paralyzed from the pressure; the function of the wrist being irretrievably impaired, the stiff, smooth fingers are an ignominious monument to the carelessness of the surgeon and the attending nurse. Let it be an unfailing, unalterable rule that all fractures in splints of any description be regularly inspected so that the swelling of the part never becomes so great as to impair the circulation. The pulse at the wrist in fractures of the arm and forearm, and the pulse at the dorsum of the foot in fractures of the lower extremity should always be palpable after a splint has been applied. This is simple and safe assurance that the blood flow to the limb is not seriously impaired. Very often a patient will complain of pain in an area other than that of the fracture. The splint should always be carefully inspected to determine the source of the discomfort. Occasionally in circular casts, it is a good plan to cut a window in the plaster in the area of pain

FRACTURES

so as to relieve the pressure which is invariably causing the distress. By doing this, the incidence of ulcers from pressure will be reduced to the minimum.

Before any splint is applied it is of prime importance to cleanse the injured part. The nurse, always being mindful of the injury, should do this gently and carefully, causing as little pain as possible. This procedure should be completed by dusting the skin of the broken limb with talcum powder.

Splint Materials.—Any material which is light and strong is suitable for a splint. The following are some of the more widely used materials:

Wood.—Wood has been used for centuries to support broken limbs. Probably the best splints are the basswood. Basswood splints usually come in sizes of 18 x 4 x $\frac{1}{4}$ inches. When they are padded carefully with cotton, they make a good temporary splint, and because of the lightness of the wood, they can be cut to any desired size. The one great disadvantage is that it is impossible to mold them accurately.

Plaster of Paris.—This is perhaps the most widely used splinting material in civilian practice, and, beyond doubt, its widespread application is justifiable. It is easy to obtain, strong, moderately light, and when soft lends itself to accurate and easy moulding. Plaster of Paris is best handled in the form of plaster of Paris bandages. The manner in which they are made is given under **BANDAGING**.

Plaster of Paris Bandages.—These are applied as any other bandage, the limb having been previously padded with non-absorbent cotton. Extreme care should be taken to apply the bandages smoothly, without wrinkles and rather snugly. The number used is dependent upon the desired thickness of the cast. After this has been obtained, the cast may be further smoothed by applying an excess of plaster and polishing the same with long strips of cheese cloth moistened with peroxide of hydrogen. Plaster usually dries in from one to eight hours. For the first thirty minutes, the limb should be held until the plaster has partially dried, because the cast may become distorted by pressure of surrounding objects.

While it is not a universal practice, a great many surgeons deem it advisable to cut all circular casts in the direction of their longitudinal axis, in two parallel lines, diametrically opposed. The reason for this is obvious. Should the limb become swollen, the danger of any untoward complications, such as pressure necrosis, with a subsequent Volkman's paralysis, is materially lessened. When the cast has been cut, a bandage is applied to hold the segments in place.

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Not only does cutting down a cast insure a "safety first" policy, but it becomes very convenient to do so when baking and massage are employed, as the cast may be quickly removed and efficiently reapplied after each treatment.

If, for some reason, the surgeon should decide to leave the case intact, and to have it cut at a subsequent date, it must not be forgotten that dried plaster is almost stone-like.

Spicas.—When a long bone is broken, such as the femur, or the pelvis, heavier splints are required because greater strength is necessary to overcome the powerful contracting influences of the muscles of the thigh. Splints in this region have but little value aside from their first aid application. If the surgeon desires to use plaster for these conditions a spica bandage of plaster of Paris is employed. These extend from the region of the umbilicus down to the toes on the affected side.

The technic of the application of the plaster is the same, but there are several factors which are a little different and demand special mention. First the mechanical, for after all, plaster has only a certain tensile strength. If this is exceeded, the plaster is apt to crack and break, rendering the spica useless. In order to prevent this, it is customary to reinforce the cast, especially in the lateral region, i.e., from the hip to the knee and over the anterior aspect of the thigh. The reinforcing material may be strips of basswood, wire mesh, or sometimes longitudinal strips of plaster of Paris in the form of molded splints. Then, in applying the cast, inasmuch as the lower abdominal region is included, sufficient space must be allowed for the possible distention of the small and large intestines. In other words, ample room must be left for the patient's appetite. This is accomplished by laying two or three folded towels on the abdomen, and winding the plaster so as to include them temporarily, removing them after the plaster has hardened.

Since the spica winds about the genitals and anal orifice, great care must be taken that there is no undue pressure against these organs, and that the patient is able to defecate and urinate without difficulty. In children whose control is apt to be lax or involuntary, it is customary to coat the cast with shellac, thus rendering it impervious to the urine. Spicas, as well as all other complicated plaster work, are applied with great facility and more efficiently if the patient is resting on a "Hawley" table.

Traction.—Traction is used to correct overlapping or overriding bone fragments and lateral deformities. Through its agency, those muscles are relaxed which by their contraction might have resulted in malpositions of the fracture. In addition, if properly applied, it automatically secures the

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proper alignment of the bone ends and prevents the fragments from being displaced, thus avoiding injuries to muscles, blood vessels, or nerves.

Suspension.—While traction is an important element, suspension has enhanced its value by rendering greater comfort to the patient, and making much easier the surgical dressing of the wounds. The limb is usually suspended to an overhead wooden or metal frame developed from the original Balkan frame. This consisted of two uprights with a cross piece at each foot of the bed supporting a horizontal bar.

Open Operation for Fractures.—In these fractures, which are not compound, when reduction has been impossible, it is often necessary to perform an open operation, reduce the fracture under the direct vision of the surgeon, and then hold the fragments in place by some mechanical measure.

FROST-BITES

Frost-bites occur as the result of prolonged exposure to extreme cold. The parts of the body most commonly affected are the fingers, toes, ears, nose, and the skin over the cheek bones. These are the most exposed parts, the blood vessels are near the surface so quickly affected by the cold, and the blood is soon chilled. The circulation in the extremities is also apt to be poor while the ears, nose and cheek are not protected by clothing or hair.

The parts affected are at first livid; later, as venous congestion occurs, cyanotic, swollen and pulseless, then turn purple and finally a greenish-black.

Chilblains may occur in the fingers and toes as the result of exposure to less extreme cold, with moisture. The parts are at first pale due to contraction of the blood vessels and the resulting anemia. Later they become cyanotic and, when in the warmth, remain purplish but swell and become extremely painful and disabled.

The **treatment** in the early stage of frost-bite consists of rubbing the part with snow or a cloth wrung out of ice-cold water, gradually making the applications warmer. The patient should not be brought into a warm room until the color of the part is normal, showing that the circulation has been reëstablished. The aim is to restore the tone of the blood vessels and allow the blood to return gradually. The application of heat to a frozen part in which the vessels are paralyzed and engorged with venous blood would further reduce their tone and increase the supply of blood so rapidly as to cause rupture and bleeding into the tissues and almost certain death of the part.

When the circulation is reëstablished, a loose dressing is applied, with warmth and elevation of the part to improve

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the circulation. If sloughing occurs, hot antiseptic dressings are usually applied to hasten the separation of sloughs and to lessen the danger from the absorption of septic material. If gangrene develops it is usually of the dry type. The part is kept dry, may be dusted with a dry antiseptic powder, and covered with an absorbent cotton dressing until separation takes place at the line of demarcation or, in some cases, it is removed by amputation. See BURNS, and EAR NURSING.

G

GALACTAGOGUES

Galactagogues are drugs or other agents which increase the secretion of milk. Most drugs are unsatisfactory for this purpose. Attention should be directed to the underlying cause of the deficient secretion; and generous diet, milk, etc., may help. See MILK, MOTHER'S.

GALL BLADDER

Post-operative Treatment.—Operations in and about the gall bladder are accompanied by a great deal of shock, and as most operations involving the upper abdomen are attended by a large percentage of pneumonia, all means must be taken to insure perfect care of the patient, to prevent him from being chilled or caught in draughts.

In those cases in which the gall bladder is drained, or where a cholecystotomy is performed, the end of the drainage tube should be inserted into a bottle so that the bile may be collected, its character observed, and the amount estimated. Occasionally, bile will leak along the side of the drainage tube, resulting in a general soaking and discoloration of the dressing. If this discharge is very marked, the superficial layers of the dressing may be removed and fresh compresses applied.

It is important that all urine should be examined closely for the presence of bile, and that the stools be sent to the laboratory to determine whether bile is present. While the gall bladder is draining, the patient must be placed upon a diet which is poor in fat, because the bile salts which aid in the saponification of the fats are missing. And see LIVER.

GALL STONES

Certainly the most frequent affection of the liver, and that one which most concerns the nurse, is that of gall stones (**cholelithiasis**). In this condition the gall bladder, or any of the bile ducts of the liver, may be the seat of

GALL STONES

stones. It is true that these stones may lie in the gall bladder and never cause any symptoms. But when the stone leaves the gall bladder and becomes impacted or caught in some of the ducts, for example, the cystic or common bile duct, symptoms of gall bladder colic ensue. If the stone is impacted in a cystic duct, the gall bladder may become slightly dilated with resulting pain and tenderness in that region; if the stone becomes impacted in the common duct, inasmuch as the flow of bile is impeded on its way to the intestine, there is *jaundice* which may be very marked. As a result of the jaundice, and no passage of bile into the intestine, the stools are white, clay colored, and foul smelling; the urine is dark-brownish in color; and the skin is yellow, due to the deposition of the bile pigment in the skin itself.

Medical Treatment.—During an attack of colic, the patient is given large doses of morphine and placed in bed. Over the region of the gall bladder it is advisable to place hot applications, either poultices or stupes. Following these attacks the patient should have a light diet with the minimum amount of fat. Intestinal elimination should be kept free by using salts, especially sodium phosphate. There is a popular superstition that consuming olive oil aids the free passage of gall stones. This is very much exaggerated and without scientific foundation.

Operative Treatment.—Operative measures are employed when there have been repeated attacks of colic, when the stone has become impacted, or when the gall bladder is acutely inflamed or filled with pus.

Ante-operative Treatment.—The ante-operative treatment is of extreme importance in jaundiced cases because jaundice is one of the factors which prevents or delays the clotting of blood. Naturally, pre-operative measures must be taken to ensure a lowering of the coagulation time. This may be accomplished by the administration of calcium lactate, horse serum, or transfusion.

The position of the patient on the operating table is important because the gall bladder and its passages lie deep within the abdomen, and every effort must be made to make them as accessible as possible. This is attained by placing the patient on the table so that the gall bladder bridge may be elevated, thus forcing the liver forward; or a sand bag may be placed in the region of the eleventh or twelfth ribs. Both methods yield good results.

Operations.—The operations which may be performed upon the gall bladder and its ducts are cholecystotomy, cholecystostomy, cholecystectomy, choledochotomy, and cholecystenterostomy.

GAMBOGE

Cholecystotomy.—This is an operation in which the gall bladder is opened, the stones removed, and the original incision in the gall bladder closed. It is not often performed because the gall bladder generally requires drainage.

Cholecystostomy.—In this operation the gall bladder is not removed, but it is drained; the drainage is placed into the gall bladder itself by burying the tube with a purse-string suture.

Cholecystectomy.—This procedure is the most frequent; it involves the removal of the gall bladder and the ligation of the cystic duct and the cystic artery.

Choledochotomy.—In those cases in which the stone lies impacted in the common duct, the removal of the stone by incision of the duct is spoken of as choledochotomy. This operation entails drainage of the common bile duct.

Cholecystenterostomy.—Sometimes the obstruction of the common duct is such that it cannot be removed; for example, stricture of the duct, either benign or carcinomatous. If the patient is suffering from intense jaundice, an attempt is made to short-circuit the bile. This is done by establishing an anastomosis between the gall bladder and the stomach or between the gall bladder and the small intestines. This operation is spoken of as cholecystenterostomy.

GALLIC ACID

Gallic acid is an organic acid which is usually made from tannic acid by its combination with water. Gallic acid has a milder action than tannic acid. It is more readily absorbed into the blood, and is only used to check excessive secretion of sweat, of bronchial mucus and to check bleeding from the lungs or kidneys, but it is not very effective. Dose, 5 to 30 grains.

GAMBIR

Gambir or pale catechu is an extract made from the leaves and twigs of *Ouraparia gambir*, an East Indian shrub. It is used as a powerful astringent; contracting the tissues and checking the secretions of mucous membranes, because of the tannic acids which it contains.

Preparations

Gambir; dose 15 grains.

Compound Tincture of Gambir; dose 1 dram.

Troches of Gambir, each containing 1 grain.

GAMBOGE

Gamboge is a gum resin obtained from the *Garcinia hanburii*, a tree of Siam. The leaves and young branches

GARGLES

of the tree are broken off, and the juice, which is the gum resin, is caught from the broken twigs in vessels and dried.

Gamboge is one of the most violent drastic purgatives and may cause very severe collapse. Dose 2 to 10 grains.

GARGLES

Mouth washes and gargles are used for diseased conditions of the mouth and throat: to cause an antiseptic or a constricting (astringent) effect. In administering mouth washes and gargles it is essential to bring the drug in contact with every part of the lining membrane of the mouth and throat. This is usually accomplished by keeping the fluid in the mouth and moving it about by means of a current of expired air.

Fluids applied in this manner do not affect the tonsils or pharynx to any extent, since they do not reach back far enough. Local applications to these tissues are best applied by sprays or irrigations.

Irrigation is a very good method for applying medicines to the throat. It is usually done by means of a glass nozzle attached to an irrigating bag, with the patient lying down, the head on the side and the mouth and chin slightly tilted forward.

GASTRITIS

Dietetic Treatment of Acute Gastritis

Starvation Period.—Twenty-four hours of total abstinence from food may seem extreme, but as a rule in acute cases of gastritis it is the only sane and safe method of instituting a diet and thus beginning to overcome the cause of the disturbance. After the period of starvation the diet is begun with caution.

Fluid Diet.—Fluids should be given first in the form of well-skimmed broths, which may be reënforced with egg or cereal flours when the patient is very thin or anemic. Buttermilk, made with the Bulgarian cultures, koumiss and other fermented milk foods, liquid beef preparations such as peptonoids or panopepton, albumenized orange juice, cereal gruels treated with Taka diastase when it is found necessary, and peptonized milk. These may be given in from four to six ounces at a time, every two hours on the second day.

Increasing the Diet.—On the third day if the attack is slight the diet may be increased by adding toast, softened with peptonized milk, an ordinary serving (3 ounces) of farina, cream of wheat or rice, reënforced meat broth with two crackers, a cup of tea and a slice of toast, and one or two soft-cooked eggs. If the acute symptoms are still

GAVAGE

present on the third day, the diet advised for the second day must be continued until they disappear.

Convalescent Diet.—On the fifth day, if progress is satisfactory, lightly broiled chicken or a small piece of rare broiled beefsteak may be added to the diet and the meals reduced in number from six to four.

Relapse.—The patient must be warned against over-eating or eating any of the articles which are known to cause an acute attack in his individual case, since one attack predisposes to another, and chronic gastritis may develop as the result of the continual gastric disturbance.

Dietetic Treatment of Chronic Gastritis.—The foods constituting the diet in chronic gastritis must be of the simplest character and prepared in the simplest manner. No fried foods are permissible. Pastries, griddle cakes, rich puddings and sauces, candies, and alcoholic beverages must be omitted from the diet as well as the following articles of food: pork, veal, shellfish except oysters, sardines, canned meats and canned fish, highly seasoned and spiced dishes, twice-cooked meats, vinegar, pickles, olives, cold slaw, pickled beets, catsup, mustard, coarse fibered vegetables such as cabbage, old onions, old turnips, and cucumbers, strong tea, coffee, or chocolate, rich cream or dishes made entirely of cream. In cases of excessive acidity due to a hypersecretion of HCl the extractives of meat are contraindicated, hence all gravies and outside parts of roasted meat must be omitted or limited in the diet.

GASTRIC, GASTRO-

See STOMACH.

GASTRORRHAGIA

See HEMATEMESIS.

GAULTHERIA

See SALICYLIC ACID.

GAVAGE

Gavage is a word used to indicate forced feeding through a tube. It is a method of introducing liquid food or medicine into the stomach through a stomach tube for patients who cannot, or will not swallow food.

It is **indicated** in the conditions following:

1. In some operations on the jaw or tongue.
2. In insanity, when the patient refuses food and is in danger of starving. It is also given to fasting or hunger-striking prisoners for the same reason.
3. Where the feedings the patient is able to take are inadequate.

GAVAGE

4. In strictures or spasms of the esophagus when the patient cannot swallow food.
5. In conditions in which patients are unconscious.
6. In tetanus.
7. In poisoning, to introduce an antidote for the poison.

The necessary *articles* will be the same as for a lavage with the exception of the flask containing the nourishment, and as all the fluid is to be retained no pail will be required. The *temperature* of the fluid should be about 105° F. It should always be tested to avoid the danger of burning the patient.

The tube is introduced in the same way as for a lavage. The stomach will probably try to get rid of it by contraction of its muscular walls at first, so before introducing the fluid, wait a few moments until the peristalsis or unrest has subsided. Allow the fluid to flow in slowly, and with no force, so as not to excite peristalsis. Before all the liquid has left the funnel and tubing, pinch the tube and withdraw gently but quickly in order to prevent air from entering and also to prevent the entrance of fluid into the trachea.

After the treatment the patient should be left comfortable, quiet, and undisturbed, so as to avoid the expulsion of the nourishment. See LAVAGE.

Nasal Gavage

In this method of feeding, liquid food is introduced into the stomach through a rubber catheter which is passed through the anterior and posterior nares and the pharynx into the esophagus. When forced feeding is necessary this method is less exhausting.

It is *indicated* (1) when a patient is in a weakened condition and cannot swallow food; (2) sometimes in operations on the mouth, such as carcinoma of the tongue, a cleft palate or fracture of the jaw, etc.; (3) in operations on the throat and sometimes after a tracheotomy; (4) in tetanus or meningitis with a locked jaw; (5) in forced feeding for irritable or violent patients; (6) in very weak infants.

The *articles* required will be a medium sized rubber catheter with a small glass funnel attached, in a basin of cold water, a lubricant, a flask containing the nourishment, cut gauze, a paper bag, dressing rubber and drawsheet.

The *position of the patient* may be lying down with the head turned to one side or sitting up with the head tilted forward. An infant should lie across the knees with its head turned away from the nurse. The catheter should be inserted in the uppermost nostril.

The *food* may consist of any liquid food which will readily pass through the tube.

GELSEMIUM

The *temperature* of the liquid should be *warm* not hot. The lining of the nose is much more sensitive than that of the mouth and the danger of burning the patient is greater when feeding by this method.

Method of Procedure.—When inserting the catheter direct it toward the septum of the nose. First lubricate it. If there is difficulty in passing the tube remove it and insert it in the other nostril. The septum of the nose is frequently deviated or deflected, making the chambers of the nose unequal in size. The tube should reach into the esophagus, so pass all the tube with the exception of a few inches which are necessary in manipulating the funnel.

As the catheter is small there is considerable danger of its passing into the larynx, therefore when introduced observe the patient's color and breathing before pouring in the solution, which would drown the patient if the tube should be in the larynx. Even a small amount of food in the lungs, besides being the cause of severe irritation and dyspnea, if allowed to remain (that is, if not coughed up), would decompose and probably lead to a lung abscess or septic pneumonia. If the tube is in the trachea a whistling sound will be heard when the funnel is held to the ear, while if in the esophagus probably a gurgling sound.

As the tube is soft it may become coiled upon itself in the mouth or in the throat. If the fluid is poured in while the tube is in this position it will cause gagging, choking and gasping, and will almost certainly enter the larynx causing dyspnea, cyanosis and later a possible abscess and septic pneumonia. Look in the mouth or pass the finger to the back of the throat to see if the tube is in position. Before pouring in the solution, wait until the parts are at rest, until all distress has subsided and normal breathing is established and to make sure that the tube is in the esophagus. Then as a further precaution pour in only a few drops at first, then pour the balance in very slowly if there are no symptoms of choking.

After all the fluid has left the funnel, pinch the catheter and quickly withdraw.

GELSEMIUM

Gelsemium is obtained from the roots and underground stems of the *Gelsemium sempervirens*, yellow jasmine, or Carolina jasmine. Its active principles are two alkaloids: *gelsemine* and *gelseminine*, the gelsemine being the more active of the two.

Appearance of the Patient

About fifteen minutes to a half hour after giving a dose of gelsemium, the patient feels tired and languid. The

GELSEMIUM

pulse is perhaps somewhat slower and weaker. If the patient has had muscular twitchings, these are lessened.

The only **local effect** produced by gelsemium is the dilatation of the pupil, which follows its application to the conjunctiva.

Internal Action.—When taken internally, gelsemium is readily absorbed into the blood in about fifteen to twenty minutes, and it then affects principally the muscles, the respiration and slightly the heart.

Action on the muscles: Gelsemium lessens the contractions of the muscles by paralyzing their nerve endings, which receive the impulses for their contractions. In this way it lessens muscular twitchings, which are very fine muscular contractions.

Action on the respiration: Large doses of gelsemium make the breathing slow and shallow.

Action on the circulation: The pulse is made slower and weaker by large doses.

Excretion

Gelsemium is rapidly eliminated from the body by the urine, usually in about two to three hours.

Poisonous Effects

An overdose of gelsemium usually causes the following serious symptoms; which may often endanger the patient's life:

Symptoms.—1. The patient becomes tired, languid and drowsy, but does not fall asleep.

2. The movements of the muscles become weak and unsteady, the jaw drops, the eyes may be tired, or the eyelids may droop, and the pupils dilate. The speech is often indistinct, and the patient staggers as soon as he attempts to walk. (These symptoms are due to the beginning paralysis of the muscles.)

3. Occasionally there is nausea and vomiting with profuse flow of saliva.

4. The skin is moist, cold and insensitive to pain.

5. The pulse is slow and weak.

6. The breathing becomes very slow and shallow, and death results from the paralysis of the breathing.

The patient is conscious to the last, though there may be partial blindness before death.

Treatment.—1. Wash out the stomach.

2. Keep the patient quiet.

3. Give artificial respiration.

4. Heart stimulants such as atropine, strychnine, etc., are usually given.

GLASS EYES

Uses

Gelsemium is used principally to relieve the very painful spasms of the muscles of the face in "tic douloureux" or trigeminal neuralgia.

Preparations

Fluidextract of Gelsemium; dose 5 to 10 minims.

Tincture of Gelsemium; dose 5 to 15 minims.

GENTIAN

The root of the *Gentiana lutea*, or the yellow gentian of the Alps.

Gentian is often used as a mild laxative.

Extract of Gentian; dose 2 to 10 grains.

Compound Tincture of Gentian; dose $\frac{1}{2}$ to 4 drams.

GERMAN MEASLES

See INFECTIOUS DISEASES, COURSE OF.

GIN

See ALCOHOL.

GINGER (ZINGIBER)

Ginger is the dried roots of the *Zingiber officinale*, which grows in the East and West Indies. Green ginger is the fresh, and black ginger, the dried roots. The fresher it is, the more active is the ginger. It is used as a carminative.

Tincture of Ginger; dose $\frac{1}{2}$ to 1 dram.

GLASS EYES

Care of Artificial or Glass Eyes.—An artificial eye worn by a patient should be washed frequently and should be removed every night. Patients frequently do this for themselves but it is important for a nurse to know the proper method of procedure. The following instructions are taken from the text prepared by the Manhattan Eye, Ear and Throat Hospital.

To Insert the Eye:—"Place the left hand flat upon the forehead, and with the tips of the two middle fingers raise the upper eyelid. With the right hand push the edge of the artificial eye beneath the upper lid, which may now be released by the fingers and allowed to drop upon the eye. The latter must then be supported by the fingers of the left hand, while with the right hand the lower lid is drawn forward and made to secure the lower edge of the shell, thus holding it firmly in place."

GLAUBER'S SALT

To Remove the Eye:—"Draw down the lower lid with the middle finger of the left hand. Then, with the right hand, place the end of a small blunt instrument under the edge of the artificial eye, which is made to slip forward over the lower lid, when it will readily drop out. This manuever must be carried out with care, as the eye can very easily be destroyed by dropping on a hard surface." The eye should be put away carefully for safe keeping and to avoid breakage or roughening of its surface. The eye socket should be watched for signs of irritation or inflammation. In some cases mucus and tears are apt to collect between the stump and the shell. It is said that after a year the surface and edges of the eye become roughened so that it must be replaced by a new one to avoid irritation.

GLAUBER'S SALT

See SALINE PURGATIVES.

GLONONIN

See NITRITES (NITROGLYCERINE).

GLOTTIS

See LARYNX.

GLUCOSIDES

Glucosides are active principles of plant drugs which always form a sugar (usually glucose, or grape sugar, hence the name) when decomposed by acids, heat, bacteria or other agents. They are neutral substances, because chemically, they are neither acids nor alkalies. The names of all glucosides end in "in." Alkaloids, properly, end in "ine."

GLYCERIN

Glycerin is a liquid made by decomposing animal or vegetable fats.

When **applied to the skin** or to a wounded surface, glycerin smarts and is painful for a few minutes, and then it softens the skin. It has the property of withdrawing fluid from the tissues (hygroscopic).

It is often given internally or it is injected into the rectum. It then produces mild movements of the bowels without any colic. Dose 1 to 2 ounces.

There are a number of preparations of various drugs made up with glycerin. They are known as glycerites. The chief are the glycerites of starch, and of egg yolk.

GOLDEN SEAL

GLYCERITES

See GLYCERIN.

GLYCOTHYMOLINE

See under BORIC ACID.

GLYCYRRHIZA (LICORICE ROOT)

Licorice is the root of *Glycyrrhiza glabra*, an English plant. Its active principle is a glucoside, **glycyrrhizin**.

Applied to the skin it is soothing and protecting (demulcent). Taken internally it is a mild purgative.

Preparation

Compound Licorice Powder (*Pulvis Glycyrrhizæ Compositus*); dose 1 dram.

This contains senna, licorice root, sulphur, fennel and sugar. It should be given in very little water, as it may cause nausea, but it should always be followed by a drink of water.

Licorice powder is best given at bedtime. It is an excellent purgative, producing frequent fluid stools without griping, in about ten to fifteen hours; or in three to six hours, when given on an empty stomach.

It is especially valuable in patients suffering from hemorrhoids. The fluid stools resulting from licorice powder lessen the pain produced by movements of the bowels in cases of hemorrhoids.

Licorice forms an ingredient of many cough mixtures. It lessens coughing by protecting the mucous membrane of the throat and larynx and thus avoiding irritation. The following is the most commonly used preparation containing licorice:

Brown Mixture (*Mistura Glycyrrhizæ Composita*); dose 1 to 2 drams.

This mixture is a soothing cough mixture which also contains opium.

GOA POWDER

See CHRYSAROBIN.

GOITRE

See THYROID GLAND, DISEASES OF.

GOLDEN SEAL

See HYDRASTIS.

GONORRHEA

GONORRHEA

See VENEREAL DISEASES.

GOULARD'S EXTRACT

See LEAD.

GRAM'S STAIN

The fixed film is covered with a fresh solution of anilin gentian violet made as follows: One c.c. of anilin oil is added to 10 c.c. of water and shaken until thoroughly emulsified, after which it is filtered through wet filter paper. One part of saturated alcoholic gentian violet is then added to nine parts of the filtrate. The slide is allowed to remain in the above dye for five minutes, after which it is immersed in the following iodine solution for 2 to 3 minutes.

Iodine	1 gm.
Potassium iodide	2 gm.
Distilled water	300 c.c.

The film is then decolorized with 97 per cent. alcohol about one minute or until no more stain can be washed out of the preparation, after which it is washed in water and counterstained with eosin for thirty seconds.

This method of staining is frequently used in bacterial differentiation. By its means organisms are divided into two classes; those which retain the initial stain are spoken of as **Gram positive** and those which are decolorized and take the counterstain as **Gram negative**. Most bacteria fall decidedly into one class or the other; borderline cases do occur, however, and a few species show a tendency to change from Gram positive to Gram negative in old cultures.

CLASSIFICATION OF THE PRINCIPAL PATHOGENIC BACTERIA
ACCORDING TO THEIR REACTION TO GRAM'S STAIN

POSITIVE	NEGATIVE
(Retain the violet stain)	(Take the counterstain)
<i>Cocci</i>	<i>Cocci</i>
M. tetragenus	M. catarrhalis
Pneumococcus group	M. gonorrhæ
Staphylococcus group	M. meningitidis
Streptococcus group	M. melitensis

GRANATUM

POSITIVE	NEGATIVE
<i>Bacilli</i>	<i>Bacilli</i>
B. aërogenes capsulatus	B. acidi lactici
B. anthracis	B. coli group
B. botulinus	B. dysenteriae group
B. diphtheriae group	B. enteritidis group
B. tetani	B. influenzae group
B. tuberculosis and other acid-fast bacilli	B. Koch-Weeks
	B. lactis aërogenes
	B. maligni edematis
	B. mallei
	B. Morax-Axenfeld
	B. mucosus capsulatus
	B. pertussis group
	B. pestis
	B. pyocyaneus
	B. typhosus group
	<i>Spirillum</i>
	S. cholerae

GRANATUM (POMEGRANATE)

Granatum is the bark of the stem and root of **Punica granatum** or pomegranate. Its active principles are the alkaloids **pelletierine**, or **punicine**, and **isopunicine**; and it also contains a large amount of tannic acid.

Granatum and its alkaloids have a specific destructive action on tape worms. It has a very unpleasant taste and is not a safe drug to use.

Poisonous Effects

Overdoses of pelletierine or granatum, paralyze the nerve endings of the muscles, causing effects like those of curara poisoning.

- Symptoms.**—1. Mental dullness and confusion of ideas.
2. Dizziness.
3. Great weakness of the limbs, even paralyses.
4. Dimness of vision.
5. Occasionally nausea, abdominal pain, perhaps vomiting and tremors of the muscles of the legs.

Administration

Granatum is usually given as a decoction made from about 1 to 2 ounces of fresh bark, in about half a pint of water. The drug is then given in two parts at intervals of an hour each, and the last dose should be followed in a half to two hours by a cathartic.

GRAND MAL

Preparations

Fluidextract of Pomegranate; dose 30 minims.

Pelletierine Tannate; dose 4 grains.

This is a mixture of all the alkaloids of pomegranate bark.

See ANTHELMINTICS.

GRAND MAL

See EPILEPSY.

GREGORY'S POWDER

See RHUBARB.

GRIFFITH'S MIXTURE

See IRON.

GRINDELIA

Grindelia is obtained from the leaves and flowers of **Grindelia robusta**, and **Grindelia squarrosa**, plants which grow on the western coast of the United States.

It is principally used to relieve spasmodic cough by relaxing the spasm of the involuntary muscles of the bronchial tubes.

GUARANA

Guarana is a paste made from the seeds of **Paullinia sorbilis**, a Brazilian plant. It contains **caffeine** and **tannic acid**. It is used for sick headache and neuralgia. In Brazil it is also used to check diarrhea because of the tannic acid which it contains.

Fluidextract of Guarana; dose 1 to 2 drams.

(See CAFFEINE.)

GUIACOL

Guiacol is a colorless volatile liquid made by the distillation of beechwood tar creosote.

The action of guiacol is like that of creosote, with the following differences:

1. It may be absorbed from the skin and then reduce temperature.

2. Large doses often turn the urine a dark brown color and cause diarrhea.

It is used for the same conditions as creosote.

Preparations

Guiacol; dose 8 minims.

Guiacol Carbonate (Duotal); dose 5 to 20 grains.

GUY'S PILL

See SQUILL.

H

HÆMATOXYLON

Hæmatoxylon is obtained from the wood of the logwood tree. It is an excellent astringent, contracting the tissues, and checking the secretions of mucous membranes, because of tannic acid which it contains. It is used to check diarrhea, but it is apt to stain sheets and linen a bright red color. It is also used in the laboratory, to stain tissues for microscopic examination.

Preparation

Extract of Hæmatoxylon; dose 10 to 30 grains.

HALLUCINATIONS

Hallucinations are false perceptions. These are of purely mental origin for there is no recognizable external stimulus present. A patient will see persons, animals and objects in the room when none are present, will hear voices and reply to them when no sound can be heard, feel vermin crawling over his skin, feel the heat of fire which he thinks is consuming his bed, etc. Normal persons do not have hallucinations, but they occur frequently in deranged conditions of the mind, and like illusions are held to rather tenaciously, and are believed in so that the conduct is often dominated by them. The most common hallucinations are of hearing, sight and touch.

HAMAMELIS (WITCH HAZEL)

Hamamelis or witch hazel, is obtained from the leaves, bark and twigs of **Hamamelis virginiana**, an American plant. It contains tannic acid and a volatile oil.

It contracts the tissues and checks the secretions of mucous membranes. It is used to check bleeding and to lessen inflammations.

Preparations

Fluidextract of Witch Hazel Leaves; dose 30 minims.

Extract of Witch Hazel; dose 2 drams.

This is a colorless alcoholic fluid made by distilling the leaves and twigs of witch hazel. It contains very little tannic acid and a volatile oil.

HARRISON LAW

The Harrison Law went into effect March 1, 1915. It was passed to regulate the sale and use of habit-forming

HARRISON LAW

drugs such as opium, cocaine, or their derivatives, so as to prevent the occurrence of the habit. The following are the essential features of the law:

1. Every wholesale and retail druggist who sells opium, cocaine, or their derivatives must be registered annually with the Department of Internal Revenue and pay an annual tax of one dollar. They are permitted to sell any of the substances listed under the law, only upon the written order of a physician, pharmacist or dentist who is also registered with the Department of Internal Revenue.

2. Every physician and dentist must be registered with the Department of Internal Revenue and pay an annual tax of one dollar. They must keep a record of the quantities, and drugs obtained, and of their disposal. These records are subject to inspection at any time. Prescriptions calling for any substance listed under the Harrison law must bear the physician's name, address and registry number. They must also contain the patient's name, age and address, and must be dated on the day they are written and signed by the physician ordering them.

3. Any unauthorized person who has any of the substances listed under the law in his possession, is subject to a fine of \$2,000 or five years' imprisonment or both.

List of Drugs under the Harrison Law

Opium	Coca
Opium Powder	Fluidextract of Coca
Opium tablets (all strengths)	Cocaine
Extract of Opium	Cocaine Hydrochloride
Dover's Powder	Cocaine tablets (all strengths and all combinations)
Tincture of Dover's Powder	Codrenin
Tinctura Opii Simplex	Eucaïne
Tincture of Deodorized Opium	Holocaine
Morphine Sulphate (all strengths and all tablets)	Novocaine
Magendie's Solution	Tropacocaine
Codeine and its salts	Anesthesin
Codeine tablets (all strengths)	Orthoform
Dionine (all strengths)	
Codeonal	
Heroine (all tablets and all strengths)	
Papaverine	
Pantopon	
Apomorphine Hydrochloride	
Stypticin	
Styptol	

HEADACHE POWDERS

In addition, all mixtures or prescriptions containing opium, coca, or their derivatives except the following:

1. Preparations that contain less than 2 grains of opium in every ounce.
2. Preparations that contain less than $\frac{1}{4}$ grain of morphine, 1 gr. of codeine, or $\frac{1}{8}$ gr. of heroine, in every ounce.
3. Liniments or ointments which are used externally, except those containing cocaine or eucaine (alpha or beta), or any of their salts or synthetic substances.

Application of the Harrison Law in Hospitals

Every hospital must be registered with the Department of Internal Revenue and receives a registry number and is subject to the same regulations as physicians.

By the following method a record may be kept of the quantities used of the drugs listed under the Harrison law.

1. Substances listed under the Harrison law must be ordered for ward use upon special blanks upon which appears the hospital registry number. All drugs listed in the Harrison law must be ordered on one of these blanks and be signed by a physician.

2. Every order calling for opium, coca, or any of their derivatives must be signed by the physician who orders it, both in the order book and on the chart.

3. A special book should be kept in every ward, in which the nurse enters the name, date, journal number, the dose and the drug given. If a bottle containing any drug listed under the Harrison law is broken, a record of it should also be made. In this book the nurse is therefore able to account for the quantities of Harrison law drugs obtained from the pharmacist.

HEAD, FALLS OR BLOWS ON

Children frequently receive a blow on the head by a fall or other accident. If the blow is severe enough to cause unconsciousness, a doctor must be sent for at once. While awaiting his arrival, take the child into a quiet room, unfasten the clothing around the neck, apply ice-cloths to the head, and hot water bags to the legs and feet; but on no account give any alcoholic stimulant. If the stomach is not nauseated, a drink of hot milk will be reviving.

In some severe cases days may elapse before the child regains consciousness, and during that period nourishment must be given in the form of nutritive enemata.

HEADACHE POWDERS

ANTIPYRETICS.

HEAD LOUSE

HEAD LOUSE

See LICE.

HEART

The heart is a hollow, muscular organ, situated in the thorax between the lungs, and above the central depression of the diaphragm. It is about the size of the closed fist, shaped like a blunt cone, and so suspended by the great vessels that the broader end or base is directed upward, backward, and to the right. The pointed end or apex points downward, forward, and to the left. As placed in the body, it has a very oblique position, and the right side is almost in front of the left. The impulse of the heart against the chest wall is felt in the space between the fifth and sixth ribs, a little below and to the inner side of the left nipple.

The cavities of the heart.—The heart is divided from the base to the apex, by a fixed partition, into a right and left half, frequently called right and left heart. The two sides of the heart have no communication with each other after birth. The right side always contains *venous*, and the left side *arterial*, blood. Each half is subdivided into two cavities, the upper, called *auricle*; the lower, *ventricle*. The muscular walls of the auricles are much thinner than those of the ventricles, and the wall of the left ventricle is thicker than that of the right (the proportion being as 3 to 1). These cavities communicate with one another by means of constricted openings, the auriculo-ventricular orifices, which are strengthened by fibrous rings and protected by valves.

Valves of the Heart

The tricuspid valve.—The valve guarding the right auriculo-ventricular opening is composed of three irregular-shaped flaps, or cusps, and is named tricuspid. The flaps are mainly formed of fibrous tissue covered by endocardium. At their bases they are continuous with one another, and form a ring-shaped membrane around the margin of the auricular opening: their pointed ends are directed downward, and are attached by cords, the *chordæ tendineæ*, to little muscular pillars, the *papillary muscles*, provided in the interior of the ventricles for this purpose.

The bicuspid or mitral valve.—The valve guarding the left auricular opening consists of only two flaps or cusps, and is named the bicuspid, or mitral valve. It is attached in the same manner as the tricuspid valve, which it closely resembles in structure, except that it is much stronger and thicker in all its parts.

Function.—These valves oppose no obstacle to the passage of the blood from the auricles into the ventricles because

HEAT EXHAUSTION

the free edges of the flaps are pointed in the direction of the blood current; but any flow forced backward gets between the flaps and the wall of the ventricle, and drives the flaps upward, until, meeting at their edges, they unite and form a complete transverse partition between the ventricle and auricle. Being retained by the chordæ tendineæ, the expanded flaps of the valve resist any pressure of the blood which might otherwise force them to open into the auricle; at the same time the papillary muscles, to which the chordæ tendineæ are attached, contract and shorten and thus keep them taut.

Semilunar valves.—The valves between the ventricles and arteries are called the semilunar valves (*aortic and pulmonary*). These valves consist of three half-moon-shaped pockets, each pocket being attached by its convex border to the inside of the artery where it joins the ventricle, while its other border projects into the interior of the vessel. Small nodular bodies, called the *corpora Arantii*, are attached to the center of the free edge of each pocket.

Function.—These valves offer no resistance to the passage of blood from the heart into the arteries, as the free borders project into the arteries, but they form a complete barrier to the passage of blood in the opposite direction. In this case each pocket becomes filled with blood, and the free borders are floated out and distended so that they meet in the center of the vessel.

HEATSTROKE AND HEAT EXHAUSTION

Heatstroke

Heatstroke results from exposure of the body to a high external temperature from any source, especially when the air is saturated with moisture. It differs from *sunstroke* in that the person need not be exposed to the direct rays of the sun. It may occur at midnight or in a close, poorly ventilated room. The condition is more apt to develop in debilitated persons or in persons engaged in hard physical labor, especially in those who are in the habit of drinking beer or whiskey, and whose clothing does not allow for sufficient heat elimination by the rapid evaporation of moisture from the skin.

The **symptoms**, as described by Dr. W. G. McCallum, are as follows:

“The mildest effect (heat prostration) consists in headache, moderate rise in temperature, pains in back and limbs, and extreme exhaustion. More severe is the asphyctic form, in which great dyspnea and cyanosis, with delirium or unconsciousness are added to these symptoms. Still more severe,

HEATSTROKE

and frequently fatal, is the hyperpyretic type, in which unconsciousness and collapse come on suddenly, or after several days of vague premonitory symptoms. There are convulsions, delirium, or profound coma with shallow and gasping or very deep respiration, and finally failure and stoppage of the heart. The skin, at first covered with sweat, becomes hot and dry, and the temperature rises to phenomenal levels." Cases are reported having a temperature of 108° to 112° F. and even as high as 117.6° F.

The **treatment** consists in lowering the body temperature by increasing heat elimination and preventing further heat production.

The patient should be removed to a quiet, cool place and placed in bed in the recumbent position as soon as possible. His head should be slightly elevated. His clothing should be loosened and entirely removed. Cold applications should be applied continuously to the head and neck, in the form of compresses or an ice-bag, etc., and to the entire body in the form of cold sponges, affusions, baths or packs. Brisk rubbing should be applied so as to bring the hot blood to the skin. Cool enemata may also be given. The treatments are continued until the temperature drops to 101° F., after which the patient lies quietly in bed, covered with a sheet only. In giving the treatments, care is taken not to cause the temperature to fall below normal and cause collapse. The pulse must be closely watched throughout for symptoms of collapse.

When the cold applications are removed, the patient's temperature must be watched constantly as it is likely to rise again rapidly and the treatments will have to be resumed.

Even after the temperature has been permanently reduced, the patient requires extreme care on account of the danger of cerebral congestion, meningitis and secondary changes and impairment of the functions of the brain which may follow. An ice-cap should be kept on the head. Rest, quiet, fresh air, and careful regulation of the diet and body eliminations are essential.

Exposure to the sun or any form of heat should in future be avoided as one attack predisposes to another.

Heat Exhaustion

Heat Exhaustion differs from the above, in that, while it may be produced by the same conditions, the result or effect on the patient is different.

The **symptoms** are those of collapse—a subnormal temperature usually, a pale, cool, moist skin, a weak, rapid pulse, marked weakness or extreme prostration. As a rule, the patient does not lose consciousness although syncope may

HEMATEMESIS

occur. There may be restlessness and, in severe cases, delirium.

The **treatment** is directed toward raising the body temperature and in treating for collapse. The patient should be placed in the recumbent position with the head low; the clothing should be loosened, fresh air freely admitted, and external heat applied in the form of hot blankets, hot-water bottles, a hot bath or pack, and a hot enema. Hot tea or coffee may be given to drink and cardiac stimulants such as aromatic spirits of ammonia, caffeine or strychnine. The body temperature must be watched closely in order to avoid an elevation above normal as a result of the hot applications.

Rest and quiet are essential until the patient is fully recovered.

HEDONAL

Hedonal is a white, crystalline powder with a cooling effect in the mouth, like that of menthol. It produces sleep in about half an hour after it is given. It is a comparatively safe drug and produces no after-effects. It occasionally increases the flow of urine. It is given in powders or tablets; dose 30 grains.

HEMATEMESIS

Hematemesis, Gastrorrhagia, or Bleeding from the Stomach.—The vomiting of blood is not always a sign of bleeding from the stomach, because blood from the nose, throat, or lungs may be swallowed and vomited later.

Causes of Hematemesis:

1. Local.—(a) Cancer, ulcer, diseases of the blood-vessels (miliary aneurysms and varicose veins), acute congestion, and following operations on the abdomen.

(b) Passive congestion, due to obstruction of the portal system as in cirrhosis of the liver, thrombus in the portal vein, an enlarged spleen, pressure on the portal vein from without by tumors.

(c) Traumatism—wounds, corrosive poisons, etc.

2. Constitutional.—Hemophilia and severe anemia.

Treatment.—The patient must be put to bed in the recumbent position and kept absolutely quiet. Morphine is usually given to put the patient and the stomach absolutely at rest, and to aid in the formation of a clot. Nothing should be given by mouth except small quantities of cracked ice. Astringents such as adrenalin, or tannic acid are occasionally given by mouth. Cold compresses, an ice-bag or the ice-coil should be applied to the epigastrium. Ergotin

HEMOPTYSIS

is sometimes given hypodermically. No stimulants are given because of the danger of increasing the hemorrhage.

When the loss of blood has been great, syncope may result and must be treated. A direct transfusion may be given or an infusion of normal saline solution. The extremities may be bandaged toward the heart. The later treatment consists in tonics and a carefully regulated diet.

See HEMOPTYSIS, and STOMACH.

HEMOPTYSIS

Hemoptysis—the Coughing or Spitting of Blood

Causes.—1. Pulmonary tuberculosis, from rupture of a blood-vessel.

2. Diseases of the lungs—pneumonia, cancer, abscess, gangrene, etc., and ulceration of the bronchi, trachea, or larynx.

3. Certain diseases of the heart, particularly mitral lesions which cause a damming back of blood in the left auricle, next into the pulmonary vessels, causing marked pulmonary congestion.

4. Aneurysm and erosion of a large blood vessel, which may cause a fatal hemorrhage.

The following table, taken from Osler, differentiates between hemoptysis and hematemesis:

HEMATEMESIS	HEMOPTYSIS
<p>Previous history points to gastric, hepatic, or splenic disease.</p> <p>The blood is brought up by vomiting, prior to which the patient may experience a feeling of giddiness or faintness.</p> <p>The blood is usually clotted, mixed with particles of food, and has an acid reaction. It may be dark, grumous, and fluid.</p> <p>Subsequent to the attack the patient passes tarry stools, and signs of disease of the abdominal viscera may be detected.</p>	<p>Cough or signs of some pulmonary or cardiac disease precedes, in many cases, the hemorrhage.</p> <p>The blood is coughed up, and is usually preceded by a sensation of tickling in the throat. If vomiting occurs, it follows the coughing.</p> <p>The blood is frothy, bright red in color, alkaline in reaction. If clotted, rarely in such large coagula, and muco-pus may be mixed with it.</p> <p>The cough persists, physical signs of local disease in the chest may usually be detected and the sputa may be blood-stained for many days.</p>

HEMORRHAGE

Treatment.—Complete rest in bed and absolute quiet are essential. The patient is usually very much alarmed and very much depressed. He should be reassured, his mind and body both put at rest. Death is rarely due to hemoptysis from a congested lung. (Osler.) Morphine is usually given to quiet the patient. To lessen the heart-beats and lower the blood-pressure, a hypodermic of nitroglycerine, $\frac{1}{100}$ grain, or an inhalation of amyl nitrite (5 minims) is frequently ordered.

The patient should be turned on the affected side, if known, as the blood is then less apt to enter the unaffected lung. However, if the patient wants to sit up and can breathe better and is less anxious or alarmed when sitting up, it is better to allow him to do so. To lessen the nervous excitement and the distressing cough, chloral and bromides are frequently given by mouth or by rectum. No stimulants should be given or allowed in the food or drink. Ice may be given to suck.

An ice-bag is sometimes applied over the sternum or over the part where the bleeding is thought to be.

When the hemorrhage continues, salts are sometimes given to cause purging in order to lower the blood-pressure. When the hemorrhage is very severe, the head must be lowered to keep the blood in the vital parts. The extremities may be bandaged.

When food is permitted, it should be very light.

HEMORRHAGE

Hemorrhage is the escape of blood from the vessels which occurs as the result of trauma, or disease.

Varieties of Hemorrhage

I. According to Time:

(a) A *primary hemorrhage* is one which occurs at the time of the injury.

(b) An *intermediate or recurrent hemorrhage* is one which occurs in from 12 to 48 hours after.

(c) A *secondary hemorrhage* is one which occurs after a few days—from two days up to the time of complete healing.

II. According to the Cause:

(a) Trauma.

1. An *external hemorrhage* is one in which the blood escapes from the skin or soft parts.

2. An *internal or concealed hemorrhage* is one in which the blood escapes into a body cavity. Examples would be a hemorrhage into the pelvic cavity in injury to the pelvic viscera or in rupture of the Fallopian tubes; a hemorrhage

HEMORRHAGE

into the stomach; hemothorax, and bleeding into the peritoneal cavity in typhoid fever.

3. A *subcutaneous hemorrhage* is one in which the bleeding is into the soft tissues beneath the unbroken skin. Examples of subcutaneous hemorrhage are a *false aneurysm*, that is, an extensive hemorrhage from an artery into the subcutaneous tissue forming a pulsating tumor; a *hematoma*, that is, an extensive hemorrhage from a vein forming a tumor which does not pulsate; a *contusion* or bruise in which bleeding occurs from many small blood-vessels; *ecchymoses* or "black and blue marks" are hemorrhages too small to form a tumor.

(b) Disease.

1. In scurvy—bleeding from the gums.
2. In typhoid—bleeding from ulcers in the intestines.
3. Epistaxis—bleeding from the nose due to ulceration or congestion of the mucous membranes.
4. Hemoptysis—bleeding from the lungs in tuberculosis.
5. Hematemesis—bleeding from the stomach in ulcers or carcinoma, etc.

6. Melena—bleeding from the intestines from ulceration, congestion, or new growths.

7. Hematuria—bleeding from the urinary tract in diseases of the kidneys, ureters, bladder, prostate, or urethra, and from calculi or new growths.

8. Cerebral hemorrhage (apoplexy)—hemorrhage in the brain from disease of the blood-vessels.

9. Purpura and petechiæ are very small hemorrhages (petechiæ are pin points) into the skin and mucous membranes which do not disappear on pressure. They occur in infectious diseases—measles, scarlet fever, small-pox, typhus fever, in pyemia, septicemia, and leukemia and in purpura hæmorrhagica in which there may also be epistaxis, hematuria, etc.

10. Hemophilia is an hereditary disease which occurs almost exclusively in men, but is transmitted along the female line, that is, from mother to son. Men suffering from this disease are called bleeders. Their blood fails to clot so that bleeding from a slight wound or from the extraction of a tooth may be impossible to control and the patient may bleed to death. The treatment is administration of calcium lactate which aids the clotting of the blood.

III. According to the Source:

(a) *Arterial hemorrhage* or bleeding from an artery is most dangerous because difficult to control. It may be recognized by (1) the bright red color; (2) the blood escapes in spurts occurring with the heart beat or pulse; (3) in an extremity the pulse below may be obliterated and pressure above the wound (between it and the heart) controls it.

HEMORRHAGE

(b) *Venous hemorrhage* or bleeding from a vein. The blood is darker in color, due to the loss of oxygen. It flows steadily and bleeding is easily controlled.

(c) *Capillary hemorrhage* in which there is a general oozing of blood from the surface. It neither spurts nor flows steadily, but wells up in the wound and the surface seems to "weep." In a deep wound the blood trickles down over the surface and gradually fills it up from the bottom.

Hemorrhage may occur from all three sources together.

Local Treatment of Hemorrhage

Hemorrhage may be controlled by (1) pressure; (2) position; (3) extreme heat or cold; (4) astringents or styptics; (5) ligation; (6) torsion; (7) sutures; (8) the cautery.

Pressure may be made with the *fingers* (digital pressure), a tourniquet, compresses or packing and a tight bandage. The bleeding must be controlled by whatever means lies in one's power in order to prevent the patient from bleeding to death. Pressure with the fingers along the course of the bleeding vessel will control a hemorrhage temporarily even from a large vessel. Bleeding from the forearm can only be checked by pressure on the vessels in front of the elbow or on the brachial artery.

In bleeding from an artery, pressure must be made above the wound, that is, between it and the heart. In bleeding from a vein digital pressure must be made below the bleeding point, that is, between it and the periphery. Also all tight constricting bands (tight clothing or elastic garters, etc.) between the bleeding point and the heart must be removed to allow the blood to return by the deep veins.

The Tourniquet.—Fingers soon tire, so other means must be substituted. One of the most successful means of controlling bleeding from a large artery in an extremity is by applying a tourniquet above the bleeding point. The specially constructed tourniquets are made either of elastic rubber or of heavily braided material as in the army tourniquet. Improvised tourniquets may be used—rubber tubing, a folded handkerchief, a necktie, a leather strap, etc. In all cases the tourniquet must be wide enough not to cut the skin and pressure must never be made on nerve trunks. A hard, firm compress is placed over the line of the artery (where digital pressure is made) and the tourniquet is tightened around it. It must be applied tightly enough to control the hemorrhage, if necessary tightly enough to obliterate the pulse. It is never left on longer than necessary because prolonged pressure causes severe pain and may cause severe injury to the tissues and nerves and may even cause gangrene. It must be left on, however, until the services of a

HEMORRHAGE

surgeon are secured, which should be done as soon as possible. If this cannot be done within an hour usually a clot has sufficiently formed to allow the tourniquet to be loosened (but not removed) after a dressing and tight bandage have been applied to the wound.

Sterile gauze *packing* in the wound or sterile compresses held by a tight bandage will usually control hemorrhage from a vein or capillaries.

Position.—*Elevation* of an extremity is one of the simplest and most quickly applied remedies. Elevation alone or combined with other temporary remedies is usually successful and may save the life of a patient. *Hyperflexion* at the elbow or knee joints, that is, placing a pad in the bend and flexing the forearm against the upper arm or the lower leg against the thigh and maintaining the position with a tight bandage, will usually control hemorrhage from an artery in the forearm or leg. This combines position and pressure. The head, or the head of the bed, is elevated in epistaxis or cerebral hemorrhage. The foot of the bed, or the buttocks, is elevated in bleeding from the pelvis, etc.

The **application of heat or cold** will often check venous or capillary hemorrhages. When hot water is used it must be very hot, 120° to 140° F., to contract the blood vessels, as warm water causes further dilatation and bleeding. Heat also hastens clotting by coagulating the albumin of the blood and tissues. A hot vaginal or intra-uterine douche is one of the methods used to control bleeding from the uterus.

An ice-bag or ice compresses will often check capillary hemorrhages and will give great relief, check bleeding and prevent discoloration (black and blue marks) in subcutaneous hemorrhages such as contusions. The prolonged use of ice, however, may be dangerous, as it checks the circulation, lessens the supply of healing blood to the part and may cause gangrene, especially in extensive bruises or in devitalized tissues. Children and old people do not stand cold well for extensive periods.

Astringents and Styptics.—Adrenalin checks bleeding by contracting the arteries. It is used both internally and externally. The vegetable and metallic astringents such as alum, tannic acid, acetic acid, silver nitrate, ferric chloride and ferric sulphate, etc., are sometimes used to check capillary bleeding. Acetic acid is often added to a hot douche.

Ligation is exposing the bleeding vessel and tying a ligature around it.

Torsion is arresting hemorrhage by twisting the divided end of an artery which causes rupture and inversion of its inner coats.

HEMORRHOIDS

Suturing is arresting hemorrhage by suturing wounds in large vessels too large to be closed by ligature.

The **cautery** is used to check bleeding from the cut surface of bone, of inflammatory tissue and in surgical operations such as hemorrhoids.

Systemic Treatment of Hemorrhage

If the injury has been severe the patient will suffer from shock. If a considerable amount of blood has been lost he will suffer from this loss also and the effect and treatment will be much the same. Even while controlling the hemorrhage the treatment for shock should be remembered and begun at once. The patient should be kept quiet, in the recumbent position, the clothing about the chest loosened and the body warmth increased.

For the loss of blood the patient should have absolute quiet and rest in bed to lessen the work of the heart and the demands of the tissues. The head should be lowered, the trunk and extremities elevated to cause more blood to gravitate to the brain to supply the vital centers. To give the heart more blood to pump and keep blood where it is vitally needed, the limbs may be temporarily deprived of blood by elevating them and bandaging from the fingers and toes toward the heart. To increase the volume of blood direct transfusions or infusions of normal saline solution may be given. Heat may be applied to the extremities and hot fluids by mouth or by rectum may be given. Later, to aid nature repair the loss, rest, fresh air, sunlight, nutritious food and tonics (iron and arsenic) to increase the hemoglobin and stimulate the blood-forming organs are valuable.

See SHOCK.

HEMORRHOIDS

Hemorrhoids or **Piles** are simply dilated veins about the rectum. They are divided into the internal variety (those situated above the internal sphincter), and the external variety (beneath the external sphincter). Piles may be a source of annoyance by their protrusion, their bleeding, or the veins may become inflamed and thrombosed.

Ante-operative Treatment.—The treatment does not differ from that of an ischio-rectal abscess.

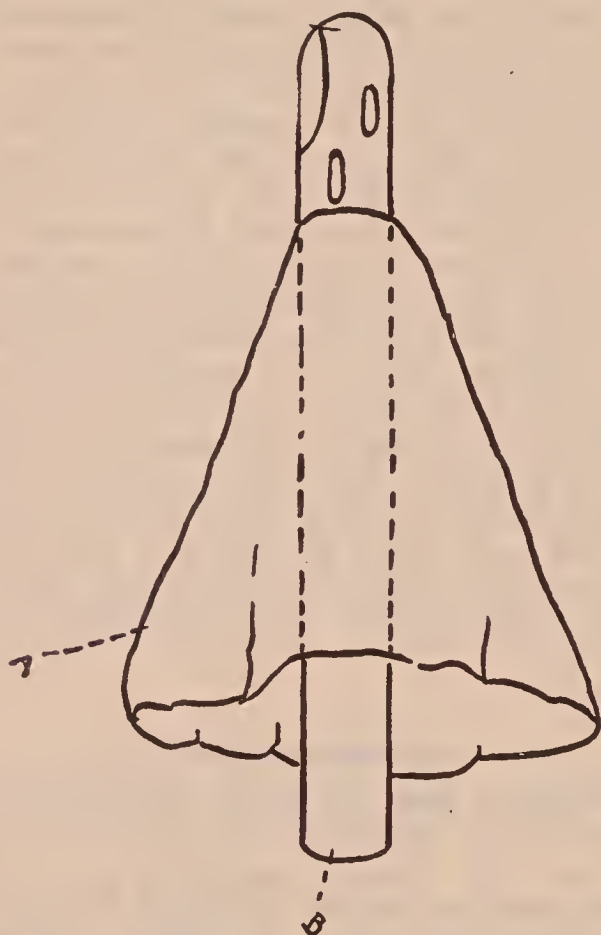
Operative Treatment.—After the patient is anesthetized, the sphincter ani is dilated manually as a preliminary step to the operation. This gives a better exposure of the interior of the rectum, and by paralyzing the sphincter, the after pain is less, since the muscle about the rectum cannot contract.

The piles are removed by (1) simple excision, (2) clamp

HEMORRHOIDS

and cautery, or (3) by ligating the pile-bearing area. After the operation has been performed, some surgeons insert a rectal tube around which has been wrapped two or three layers of vaselinated iodoform gauze. The advantages of this are twofold: it prevents hemorrhage and it enables the accumulated gas to escape; but it has the great disadvantage of being rather painful and uncomfortable for the patient.

Post-operative Treatment.—The same measures are taken as for an ischio-rectal abscess, except that on the fourth day, when the cathartic is given, immediately before the patient moves the bowels, six ounces of warm olive oil are



Tube "en chemise." A. layer of gauze attached to rubber tube B.

(From Colp and Keller's Textbook of Surgical Nursing)

introduced into the rectum through a tube. This softens the accumulated feces and lubricates their passage. Following the movement of the bowels, the patient should be instructed to take Sitz baths, night and morning. These are comforting and are very helpful in healing the denuded areas about the rectum. For a period of two to three weeks after

HERNIA

operation, the patient should receive nightly an ounce of licorice powder, as it is essential that the bowels be kept soft and loose. The patient should be put on an anti-constipation diet. (See CONSTIPATION.)

Complications.—The great danger in a hemorrhoid operation is that of hemorrhage. If a patient begins to faint and to show the signs of hemorrhage, even though no blood is visible externally, which might happen if a rectal tube is not inserted, the attending surgeon should be immediately summoned. The patient is placed under anesthesia, a tube “en chemise” is introduced and the rectum firmly packed. A tube “en chemise” is simply a rubber tube to the rectal end of which gauze is attached. It is inserted into the rectum and packing is introduced between the tube and gauze, thereby exerting pressure on the bleeding area. Sometimes the bleeding point itself may be ligated.

See CONSTIPATION, ISCHIO-RECTAL ABSCESS.

HERNIA

A **hernia**, or **rupture**, may be defined as “the protrusion of an organ or part of an organ or other structure through the wall of the cavity normally containing it.” The rupture is named from the region in which it appears. There are many locations where, because of certain mechanical weaknesses, hernia is quite common. It occurs very frequently in the inguinal region.

Inguinal hernia is a form of rupture that occupies the inguinal canal either partly or entirely.

Under ordinary conditions, the contents of the hernial sac will disappear into the abdominal cavity when the individual is at rest, to reappear when the intra-abdominal pressure is increased, as during coughing or arduous physical labors. A hernia which disappears is known as reducible; if, because of adhesions, this cannot occur it is irreducible. There are several varieties of the irreducible group: *Incarcerated*,—a type of obstructed hernia containing bowel in which the passage of fecal material is arrested but the circulation of the intestine is unimpaired. *Strangulated*,—a hernia in which not only the bowel is obstructed but also the blood supply. If this condition is not operated upon very soon after its incipency a gangrene of the obstructed loops of intestine will result.

Other varieties of hernia are *femoral*, which is a rupture in the region of Scarpa’s triangle occurring through the femoral ring; *umbilical*, which is a protrusion through the abdominal wall in the region of the umbilicus. Then there are hernias which occur following operation, especially in

HEROINE

those cases in which the abdominal wall has become weakened. These are known as *post-operative hernias*.

Ante-operative Treatment.—The same ante-operative routine is employed as for all chronic cases. The lower abdomen and genitals are shaved and a sterile dressing is applied. Care must be taken that the external genitalia are not painted with iodine. In the operating room, the operative field is repainted with iodine, and the penis and scrotum are enclosed in a sterile, wet bichloride towel.

Post-operative Treatment.—As soon as the patient reaches the ward, a pillow is placed under the knees, and as soon as he is conscious, a Bellevue bridge is applied across the thighs to support the scrotum.

The cathartic is given on the second day and, as a rule, patients are kept in bed for two or more weeks. For the first twenty-four hours catheterization may be necessary.

In cases of incarcerated and strangulated hernias after the sac has been opened, the surgeon will cover the bowels with moist warm saline towels for about ten minutes, and if there is no evidence of real damage, and their color is good, the intestines are reduced into the peritoneal cavity. If the intestines are gangrenous, an intestinal resection will have to be done. These cases are then treated like any other case of intestinal resection.

In all cases of hernia it is very important to impress upon the mind of the patients who have been recently operated on that for a few months, at least, all physical exercise should be of the mildest kind, and that any sudden strain must be avoided.

HEROINE

Heroine is an artificial alkaloid made from morphine by its combination with an organic salt of acetic acid (diacetyl morphine hydrochloride). Its effects are similar to those of morphine with the following differences:

1. It makes the breathing slower than morphine does.
2. It is used principally to lessen coughing. It does not produce sleep as easily.

Recently the heroine habit has become very common, because of the difficulty in obtaining morphine. The heroine is usually taken by snuffing heroine powder up into the nose. The symptoms are like those of the morphine habit.

See MORPHINE, and OPIUM.

Preparations

Heroine; dose $\frac{1}{24}$ to $\frac{1}{6}$ of a grain.

Heroine Hydrochloride; dose $\frac{1}{24}$ to $\frac{1}{6}$ of a grain.

HOPS

HEXAMETHYLENAMINE (UROTROPIN)

Hexamethylenamine or **Urotropin** is an artificial chemical substance which is used principally as a urinary antiseptic.

Hexamethylenamine liberates formaldehyde in the urine. This disinfects the urine and the mucous membranes of the genito-urinary tract with which it comes in contact. It only acts when the urine is acid.

It has also been used in various septic conditions because of the formaldehyde gas which it liberates in the blood and secretions. It has frequently been injected into the spinal canal for meningitis.

Large doses occasionally cause burning pain in the stomach, pain on urination, and the urine occasionally contains blood. Dose of hexamethylenamine is 3 to 10 grains.

HICCOUGH

Hiccough can often be stopped by making the person sneeze half a dozen times, or letting him sip water and hold his breath as long as possible between each sip. Another method is to pour vinegar on a lump of sugar and let him swallow it whole.

HOFFMAN'S ANODYNE

See COMPOUND SPIRITS OF ETHER.

HOLAZONE

Holazone is a complex organic chlorine compound. It acts like Dakin's solution but it does not decompose readily. It is used in tablets of 0.004 to 0.008 gm. together with sodium borate and sodium chloride. Each tablet is dissolved in a liter of water.

See DAKIN'S SOLUTION.

HOLOCAINE

Holocaine is an artificial alkaloid made from phenacetin. Its effects are similar to those of cocaine, but they appear sooner. It is also an antiseptic. It occasionally causes poisonous symptoms.

Preparation

Holocaine Hydrochloride. It is principally used in a 1 per cent. solution as a local anesthetic in the eye. And see COCAINE.

HOMATROPINE

See BELLADONNA.

HOPS

See HUMULUS.

HOT-AIR BATH

HOT-AIR BATH

This consists in the exposure of the entire body, with the exception of the head, to a superheated atmosphere.

Conditions in which the Hot-Air Bath is Commonly Used:—1. In nephritis, to stimulate the skin and induce perspiration as a means of elimination.

2. In chronic rheumatism, to raise the body temperature and cause increased oxidation and elimination of proteid wastes.

3. In obesity, to cause increased oxidation of fats.

4. In sciatica and lumbago, to relieve pain and relax muscles.

5. As a preparation for general cold applications.

It is Contraindicated:

1. In eruptive skin diseases.

2. In febrile conditions.

3. In arteriosclerosis and advanced cardiac or nephritic diseases.

Effects Produced by Hot-Air Baths.—The effects are similar to those produced by the local hot-air bath, but are general. The temperature of the blood will be higher and perspiration more general and profuse. It is important to remember that, before perspiration begins and the surface vessels dilate, there may be marked cerebral congestion with headache, nausea and vertigo, a rapid pulse and short, difficult respirations. The pulse should be watched carefully and the patient should be watched for symptoms of excitement and restlessness.

The above distressing symptoms may be prevented by applying cold to the head before the bath, by vigorous friction of the skin to hasten the dilatation of the surface vessels and by raising the temperature of the bath slowly until perspiration begins. Perspiration may be encouraged by making the patient drink a glass of water before the bath and encouraging him to drink one or two glasses during the treatment. Of course this rule does not apply in dropsical cases when the patient is on restricted fluids.

Method of Procedure.—*Preparation of the Patient.*—In a properly constructed cabinet, the patient, undressed, sits on a stool with the entire body enclosed except the head. The pulse should be taken before the bath, and, if allowed, a glass of water should be given. The face and neck should be bathed with cold water and cold applications should be applied to the head.

During the bath the patient should never be left alone. The pulse should be taken every few minutes. Fluids should be given if allowed and cold compresses kept on the

HOT PACK

head continuously. If there is a tendency toward cerebral congestion, a towel saturated with cold water may be applied around the neck. The applications must not be cold enough to check perspiration.

The *temperature* of the air is gradually raised to the desired degree in order to allow for the adjustment of the circulation in the viscera, otherwise anemia of the brain might cause the patient to faint. The desired temperature varies from 120° to 200° F.

The *duration* of the bath varies from twenty to thirty minutes.

Removal from the bath.—During removal of the patient avoid exposure, and chilling. In rheumatism, cardiac and Bright's disease, chilling is particularly to be avoided. The patient should be wrapped in a warm blanket and allowed to cool off gradually until the skin is cool and the pulse normal.

HOT PACK

This consists in wrapping the body of the patient in a blanket wrung out of water as hot as can be endured by the patient without pain or injury.

The **effects of a hot pack** are essentially the same as those of the vapor bath.

1. It communicates heat to the body, prevents heat elimination, raises the body temperature and induces perspiration. It increases the elimination of proteid ashes as the odor of urine on the blankets in some cases testifies. In this way it rests the kidneys.

2. It is highly exciting, increases the pulse rate and may cause congestion of the viscera, especially of the brain.

3. As in all hot applications, it is followed by an atonic reaction so that the blood vessels are relaxed and dilated and the arterial tension is lowered. Frequent treatments weaken the circulation, lower the resistance and depress all the vital activities.

Conditions in which a Hot Pack is most Commonly Used:—

The treatment is not usually ordered more frequently than is necessary because of its depressing effects, but may be ordered in any disease accompanied by symptoms of suppression. These are acute Bright's disease, uremic poisoning, bichloride of mercury poisoning, cardionephritis, and in the albuminuria of pregnancy and eclampsia.

The *results desired* are to induce perspiration, to relieve edema, to eliminate waste products not eliminated by the kidneys and to lower arterial tension.

Method of Procedure.—There should be two people, if possible, to give this treatment in order that it may be

HOT PACK

given as quickly and skilfully as possible without exposing or tiring the patient.

Preparation of the Patient.—The bed is usually protected by a large rubber covered with a dry blanket. The patient is covered with a second dry blanket and the upper bedclothes are turned down. The patient's gown is removed so that he lies between dry blankets. Cold applications are made to the head, water is given to drink, if allowed, and the pulse is taken.

The *method of applying the wet blanket* and the temperature of the water in which it is wrung differ in different hospitals. Sometimes, to avoid burning the patient, a dry blanket is first wrapped around the body and limbs, the wet blanket not being allowed to come in contact with the skin. The blanket is then wrung out of boiling water. In other hospitals the hot wet blanket is applied directly to the patient's skin. The blanket in this case will be wrung out of water at 150° F., that is, as hot as the patient can comfortably stand. Whatever method is used every precaution must be taken to avoid burning the patient. The blankets must be wrung as dry as possible. They should be kept hot while being carried to the bedside and applied at the right temperature. Special care must be taken to avoid burning the patient when the tissues are edematous. The wet blanket should be wrapped snugly around the patient in close contact with the whole body surface and so that no two surfaces of skin are in contact. If hot-water bags are used to maintain the heat they must never be allowed to come in contact with the wet blanket, but must be placed outside the dry blankets to prevent scalding the patient. The dry blankets and rubber are also wrapped snugly around the patient, particularly at the neck. A towel should be placed between the blankets and the face and neck of the patient. All blankets must be smooth and comfortable when applied, with no wrinkles or bulky places especially under the patient. The upper bedclothes are replaced during the treatment.

During the treatment the pulse should be watched carefully. Fluids should be given to drink if allowed, and cold should be applied to the head continuously.

Duration of the Pack.—The patient is usually left in the wet blanket for twenty minutes, unless symptoms arising prevent. After the removal of the wet blanket the patient is usually left wrapped in the dry blanket for from one-half to one hour.

Before the removal of the dry blanket the patient should be dried carefully with a heated towel and may be rubbed with warm alcohol but not vigorously enough to cause con-

HOT-WATER BAG

tinued perspiration. A warm gown is then applied. The blanket is removed; the bedclothes are rearranged and the patient is made comfortable. There should be no exposure throughout the whole procedure. Some doctors require the patient's temperature to be taken before, during and after the treatment.

HOT-TUB BATH

Conditions in which the Hot-Tub Bath is most Commonly Used:—1. In dropsy due to cardiac disease, if cyanosis is not present.

2. In dropsy due to acute nephritis following scarlet fever or diphtheria.

3. In colds to abort or break up a cold.

4. In threatened uremic convulsions to abort an attack.

5. In infantile convulsions and in asphyxia of the new-born.

6. In gall stones, gastric, intestinal or renal colic and in cystitis to relieve pain.

7. In suppressed menstruation.

8. In chronic or muscular rheumatism and obesity.

9. In icterus or jaundice, to relieve the itching and aid in the elimination of the bile-pigments from the tissues.

10. In the beginning of measles or scarlet fever to encourage the development of the eruption.

The Bath is. Contraindicated:—1. In cardiac weakness because of its weakening effect.

2. In organic diseases of the brain or cord.

3. In arteriosclerosis and threatened apoplexy.

4. In febrile conditions.

The *temperature* of the bath varies from 98° to 104° F. or 110° to 112° F., according to the condition of the patient and the effect desired.

The *duration* of the bath varies from two to thirty minutes. A temperature of 110° F. should never last more than from ten to fifteen minutes.

HOT-WATER BAG

A hot-water bag may be used as a therapeutic measure in a variety of conditions among which are the following: (1) to relieve pain in toothache or earache by drawing blood to the face and so relieving congestion in the vessels supplying the tooth or ear; (2) applied to the abdomen to relieve pain due to congestion of the pelvic organs—the uterus, ovaries or bladder—and in dysmenorrhea; (3) applied over the bladder or to the perineum to overcome retention of urine; (4) applied to the abdomen to relieve intestinal or renal colic; (5) to relieve pain in neuralgia and sciatica, etc.

Method of Application.—The temperature of the water must always be tested with a thermometer. It may vary

HUMULUS

from 120° F. to 150° F., depending upon the thickness of the cover used, the area to which the application is made, and the condition of the patient and the skin. It must never be hot enough to burn the patient should the bag leak or the rubber burst. To avoid such serious and inexcusable accidents, before use the bag must be carefully examined for leakage and for weak places in the rubber. The bag must always be completely covered with a suitable cover and the patient should be warned and watched to prevent him from removing it if he is likely to do so in the desire to relieve intense pain.

The avoidance of unnecessary weight is extremely important. If the patient must support the weight of the bag, as when applied to the abdomen, it must not be filled more than one-third full and all the air must be carefully expelled from it. Even this light weight may be unbearable and may have to be supported by suspending it from a cradle or by some other means of relieving the weight.

If the application is to be continued, see that the bag is regularly refilled and kept hot. Watch the position of the bag. The patient may be restless (particularly if in pain), displace the bag, roll over on it, and become badly burned.

Do not leave the bag with the patient longer than the application demands. See that it is dried and put away in the proper place and in the proper manner.

HUMULUS (HOPS)

Hops are the dried cones which consist of scales, of the *Humulus lupulus*, or hop vine, a plant growing in England, northern Europe, and the United States. At the base of the scales, there is a yellow powder called **lupulin**. The active principle of hops is a volatile oil. When locally applied, hops relieve pain and causes redness of the skin.

When taken internally the following effects are produced:

1. It increases the appetite and aids digestion.
2. It is soothing to the brain and lessens nervousness, and may even produce light sleep.
3. It contracts mucous membranes.
4. It is said to increase the perspiration.

Hops are usually applied in the form of bags containing the crude hops. These are soaked in water, wrung out, and applied locally, or they may be heated and used dry.

Pillows made from hops are used to induce sleep.

Preparations

Lupulin; dose 5 to 20 grains.

Fluidextract of Lupulin; dose ½ to 2 drams.

Oleoresin of Lupulin; dose 2 to 5 grains.

HYDATIDIFORM MOLE

HUNTINGTON'S CHOREA

This is a chronic form of chorea which occurs in adults. It is inherited and incurable. The movements consist of a series of writhing contortions. Speech is usually markedly disturbed, and the intellect gradually weakens to dementia. Some cases are depressed and have suicidal tendencies. Careful observation must be given and the usual nursing measures carried out. One of the difficult problems of the nurse is to keep these patients covered while in bed, and various devices must be tried to accomplish this, and at the same time allow as much freedom of movement as possible. Pajama suits in one piece which button closely about the wrists and ankles have been found useful, and give protection if the covers are thrown off. The bed must always be enclosed to prevent falls and injuries.

HYDATIDIFORM MOLE

Synonyms.—Hydatid Mole, Hydatidiform degeneration of the Chorion, Vesicular Mole.

This condition is characterized by the villi of the chorion becoming changed into strings or clusters of cysts, that vary from the size of a tiny currant to that of a grape. Their outward resemblance to hydatid cysts explains the name, but it must be clearly understood that in their real nature they have no connection with echinococcal cysts.

The condition is rare, not being met with on an average oftener than once in 2000 to 3000 pregnancies. It is more often found in multiparæ than in primiparæ, and it has been known in a number of cases to recur in the same patient. It almost always occurs early, rarely after the fourth month. When it occurs early it affects all the villi, and the embryo dies, and in most cases is absorbed. If it occurs after the placenta has taken definite shape, only a part of the placenta may be affected, and if enough is left to suffice for the needs of the fetus, it may even continue to live for a short time.

Symptoms and Signs.—(1) As the condition comes on early in pregnancy, there will be a history of a short period of amenorrhea, as well as some enlargement of the breasts.

(2) A more rapid enlargement of the uterus than in a normal pregnancy. This makes itself obvious by the third or fourth month when the uterus may be the size of a six months' pregnancy. This sign is frequent, but is *by no means invariably present*.

(3) Hemorrhage at irregular intervals, sometimes slight and repeated, in other cases profuse or continuous. Occasionally the discharge is mixed with serous fluid, and co-

HYDRAGOGUES

tains some of the small cysts looking like "white currants in red currant juice."

(4) The uterus is soft and elastic on palpation, no ballottement can be made out, no fetal parts felt, and no fetal heart heard.

(5) In some cases the reflex symptoms are excessive, such as vomiting, etc.

(6) The uterus may be tender if overdistended.

Diagnosis.—The main conditions to be distinguished from it are—

Hydramnios. Here the uterus gives fluctuation, and ballottement is easily obtained. The uterus usually feels tense and elastic.

Twins. The fetal parts and heart sounds can be detected.

Pregnancy with ovarian tumor. Here a careful examination under chloroform will reveal the true condition.

An absolute diagnosis of hydatidiform mole cannot be made unless the characteristic cysts have been observed in the discharge.

Prognosis.—The pregnancy almost always ends prematurely about the fourth or fifth month, if not interfered with before that. The fetus is almost always destroyed and usually absorbed.

The principal risks are—(1) Hemorrhage, which may be fatal at once or after prolonged bleeding. (2) Perforation of the uterus by erosion by the cyst epithelium, with consequent hemorrhage into the peritoneal cavity and possibly peritonitis. (3) The possible subsequent development of chorionepithelioma malignum.

Early diagnosis and prompt treatment make the outlook fairly good, but the continued existence of the mole constitutes a serious danger.

Treatment consists in the evacuation of the uterus as soon as possible after a diagnosis has been made. The most scrupulous aseptic and antiseptic precautions are necessary, as a woman weakened by bleeding is particularly prone to sepsis.

HYDRAGOGUES

See CATHARTICS.

HYDRARGYRUM

See MERCURY.

HYDRASTINE

See HYDRASTIS.

HYDRASTIS

HYDRASTININE

Hydrastinine is an artificial alkaloid made by oxidizing hydrastine. It produces the same effect as hydrastis, but it is more efficient and more lasting.

Hydrastinine markedly contracts the uterus and all the small blood vessels. As a result of the latter effect it increases the blood pressure. It is used to check uterine bleeding.

Preparation

Hydrastinine Hydrochloride; dose $\frac{1}{2}$ to 2 grains.

This is given hypodermically in solution, and by the mouth in pills or tablets.

HYDRASTIS (GOLDEN SEAL)

Hydrastis is obtained from the roots and underground stems of **Hydrastis canadensis**, golden seal or yellow root. It is a small shrub growing in the United States. Its active principles are the alkaloids, **hydrastine** and **berberine**.

Appearance of the Patient

After giving hydrastis, or any of its alkaloids, the patient usually has a better appetite, and the bowels move more freely. If there has been bleeding from the uterus, this is gradually checked. The pulse is slow and strong.

Local action: On the skin, hydrastis has no effect. **Applied to mucous membranes:** It increases their secretions.

Internal Action

In the mouth: It has a bitter taste and increases the flow of saliva.

In the stomach: It increases the appetite, and aids digestion by increasing the secretion of gastric juice, and the peristalsis of the muscle wall of the stomach.

In the intestines: It increases the secretion and peristalsis, causing frequent movements of the bowels.

The total effect on the circulation is to make the heart beat slower and stronger, which causes a slow and strong pulse.

Action on the uterus: Hydrastis contracts the uterus. It checks bleeding from the uterus by contracting the uterine blood vessels as well as the uterus itself.

Action on the involuntary muscles: It contracts all the involuntary muscles, such as those of the intestines, of the iris, as well as those of the blood vessels.

Hydrastis is said to increase the secretion of bile.

HYDROCELE

Excretion

Hydrastis and its alkaloids are mainly eliminated from the body by the kidneys. It is excreted very slowly, much slower than it is absorbed, so that cumulative symptoms often result from continual administration.

Hydrastine

The slow, strong pulse, the contractions of the blood vessels, the contractions of the uterus, and other involuntary muscles, are due to the action of **hydrastine**.

Berberine

The increased appetite, the increased secretions of the stomach and intestines are due to berberine, which is a simple bitter. This alkaloid is often found in many other plants used as simple bitters.

Poisonous Effects

Poisoning from hydrastis or from its alkaloids is extremely rare. In the few cases that have occurred the symptoms were the following:

1. Vomiting.
2. Headache.
3. Dizziness.
4. Difficult breathing.
5. Slow, weak, irregular pulse.
6. Convulsions.
7. Collapse; and death from failure of breathing.

Uses

Hydrastis is used for the following effects:

1. As a bitter, to increase the appetite and aid digestion by increasing the secretion of the gastric juice.
2. To check uterine bleeding.
3. For constipation, to make the stools more fluid in character.

Preparations

Fluidextract of Hydrastis; dose 15 to 60 minims.

Tincture of Hydrastis; dose 15 to 60 minims.

Glycerite of Hydrastis; dose 15 to 60 minims.

This is used principally to relieve inflammations of the mucous membranes.

Hydrastine is rarely used, but an artificial alkaloid made from it, hydrastinine, is very frequently used.

HYDROCELE

See TESTICLE.

HYDROCYANIC ACID

HYDROCHLORIC ACID, DILUTE

Dilute hydrochloric acid is used principally to aid digestion in cases where there is an insufficient amount of hydrochloric acid secreted in the stomach; and the pepsin is then unable to digest the food. This often occurs in such diseases as chronic gastritis, or in infectious diseases.

It is also used to lessen thirst, especially in fevers, and to check intestinal putrefaction and diarrhea.

Preparations

Dilute Hydrochloric Acid; dose 5 to 30 minims.

It contains 10 per cent. of hydrochloric acid.

For Local Use: Hydrochloric Acid.

This contains 31 per cent. of hydrochloric acid.

See ACIDS, INORGANIC.

HYDROCYANIC ACID, DILUTE

(Dilute Prussic Acid)

Dilute hydrocyanic acid is a 2 per cent. solution of pure hydrocyanic or prussic acid. It is a colorless, inflammable fluid which evaporates very easily.

Bitter almonds, and the kernels of the seeds of various fruits such as peaches, cherries, apricots, plums and prunes, contain a glucoside, **amygdalin** and a ferment, **emulsin**. When the kernels of these fruits are rubbed in water, the emulsin changes the amygdalin to **prussic acid**, glucose (a sugar) and another substance. The syrup of wild cherry bark (**syrupus pruni virginianæ**) also contains very small quantities of hydrocyanic acid.

1. **Applied locally to the skin or mucous membrane**, it causes numbness by paralyzing the nerve endings of the sensory nerves. It is used for this effect to allay itching and to check nausea and vomiting.

2. **Given internally**, it makes the breathing somewhat slower and shallower by lessening the impulses for breathing that are sent from the respiratory center.

Dilute hydrocyanic acid is rarely used except as an ingredient of cough mixtures to lessen the cough.

Hydrocyanic Acid Poisoning

Hydrocyanic poisoning usually results when the acid, or any of its salts are taken with suicidal intent; or from the inhalation of its fumes in a chemical laboratory. It is the most powerful poison known.

Symptoms.—When a sufficiently large dose is taken, there is a slight convulsion and death results immediately from paralysis of the heart and respiration.

HYDROGEN PEROXIDE

If the dose has not been very large, the following symptoms appear in a few seconds:

1. Nausea and vomiting.
2. The patient falls to the ground unconscious.
3. Bloated face and frothing at the mouth.
4. Dilated pupils.
5. Protruding eyeballs.
6. Very slow, shallow and irregular breathing. Often the expiration is prolonged, and followed by a long pause, during which the breathing seems to have stopped.
7. Very weak and irregular pulse.
8. Cyanosis.
9. Odor of acid on the breath.
10. Cold, moist skin.
11. Convulsions, with clinching of the muscles of the fingers and toes.
12. Paralysis of the muscles.

Death usually results from paralysis of the respiration, within fifteen minutes.

Treatment.—Rapid, vigorous treatment is necessary in order to save the patient. Usually, however, the symptoms appear so rapidly that death results in spite of the most active treatment. If the patient can be kept alive for about twenty minutes to a half hour, the chances of recovery are increased, as most of the drug is then excreted.

1. Wash out the stomach.
2. Give artificial respiration continuously, as long as the patient is alive. This helps to eliminate the drug through the lungs.
3. Apply cold applications to the head and spine to keep up the breathing.
4. Iron hydroxide, peroxide of hydrogen or potassium permanganate are usually given to neutralize the acid.
5. Heart and respiratory stimulants are usually given intravenously, or hypodermically.

Preparations

Dilute Hydrocyanic Acid; dose 2 minims.

This contains 2 per cent. of hydrocyanic acid. It should always be fresh, as it decomposes very easily.

Potassium Cyanide; dose $\frac{1}{12}$ to $\frac{1}{8}$ of a grain.

HYDROGEN PEROXIDE

Hydrogen peroxide or hydrogen dioxide is a liquid which is a chemical compound of equal parts of hydrogen and oxygen. A 3 per cent. solution of hydrogen peroxide is used in medicine.

HYDROPHOBIA

Local action: Hydrogen peroxide solution is decomposed when it comes in contact with organic matter, such as pus or blood. It then yields bubbles of oxygen. The oxygen then destroys the bacteria with which it comes in contact and disinfects the tissues. At the same time it helps to loosen the membranes and pieces of dead tissue (sloughs). The effect of the peroxide wears off very rapidly. The more pus or dead tissue present in the wound, the more oxygen is liberated.

It is used principally to irrigate wounds or sinuses containing pus. It is also used in infections in the mouth and throat and other mucous membrane lined cavities.

Hydrogen peroxide, together with sodium bicarbonate, is used to bleach the hair.

Preparation

Hydrogen Dioxide (Aqua Hydrogeni Dioxidi). This contains about 3 per cent. of hydrogen peroxide and forms about ten volumes of oxygen for every volume of the peroxide used.

HYDROPHOBIA

Hydrophobia or rabies is caused by the bite of a rabid animal, usually a dog. The virus causing the disease is in the dog's saliva which may transmit the disease to man through an abrasion or any open wound, not necessarily from being bitten.

The **symptoms**, in man, develop in from fourteen days to seven months after being bitten or otherwise infected. The time depends upon the amount of virus introduced, the point of inoculation and the susceptibility of the individual. When the bite is made through the clothing the saliva may be to a large extent removed. As the disease attacks the nervous system, when the bite occurs in tissues richly supplied with nerves, as in the face, the symptoms develop rapidly. The symptoms are headache, pain in the wound extending along the nerves, irritability, restlessness, sleeplessness, difficulty in breathing and swallowing, due to spasmodic contractions of muscles, and a marked increase in the flow of saliva. Convulsions usually follow. Death usually follows on the third or fourth day after the symptoms appear.

When the symptoms have developed the disease is invariably fatal. Prevention of the disease is therefore of the greatest importance.

Treatment.—A tourniquet is applied above the wound, if on an extremity, to prevent the poison entering the general circulation. The wound should be incised and opened freely. Bleeding is encouraged. It is then cleansed with antiseptics and hot antiseptic dressings are applied.

HYDROSALPINX

If the animal is known to be rabid the Pasteur treatment should be given immediately. This consists in the injection of a specially prepared, standardized dose of an emulsion of the spinal cord of rabbits which have been treated with the virus. The emulsion is given subcutaneously in a series of twenty-five inoculations. It stimulates the body to produce specific antibodies and thus renders the poison introduced in the saliva harmless. The treatment is very costly. After the symptoms have developed the treatment is unavailing.

The animal which did the biting should, if possible, be kept alive and under expert observation in order to determine whether rabid or not. Animals, in hot weather, may appear "mad" when suffering from heat-stroke. If the animal has been killed, the body should be sent to a laboratory where the brain may be examined. The presence of certain round or angular bodies found within the nerve cells or their processes is accepted as diagnostic of the disease.

See ANTIRABIC VACCINE.

HYDROSALPINX

See FALLOPIAN TUBES.

HYOSCINE

See HYOSCYAMUS.

HYOSCYAMINE

See HYOSCYAMUS.

HYOSCYAMUS

Hyoscyamus is obtained from the leaves and flowering tops of **Hyoscyamus niger** or **henbane**, when the plant is two years old. It grows best in England, but it has been successfully cultivated in the United States. It contains mostly **hyoscyamine**, also **hyoscine** and small quantities of **atropine**.

Hyoscyamine and hyoscine are chemically very much like atropine.

The effects of hyoscyamus are quite similar to those of belladonna and atropine, except that they are much weaker.

Preparations

Extract of Hyoscyamus; dose $\frac{1}{2}$ to 3 grains.

Fluidextract of Hyoscyamus; dose 5 to 15 minims.

Tincture of Hyoscyamus; dose 15 to 60 minims.

HYOSCYAMINE

Hyoscyamine is very rarely used. Its effects are the same as those of atropine, to which it is very closely related. It lessens the contractions of all the involuntary muscles more than atropine does.

HYOSCYAMUS

Preparations

Hyoscyamine Sulphate; dose $\frac{1}{120}$ to $\frac{1}{60}$ of a grain.

Hyoscyamine Hydrobromide; dose $\frac{1}{120}$ to $\frac{1}{60}$ of a grain.

HYOSCINE OR SCOPOLAMINE

Appearance of the Patient

About a half to one hour after the administration of hyoscine, the patient feels tired and drowsy. He becomes less active, less talkative and soon falls asleep. The sleep resembles the normal sleep, and lasts from about five to eight hours, though the patient may feel drowsy for some time after that. The pulse and breathing are slow, and the pupils are dilated. When the patient awakes, he usually complains of dryness of the throat and mouth, and is very thirsty.

Hyoscine produces sleep more easily, if the room is darkened and loud noises avoided.

The **action** of hyoscine resembles that of atropine with the following differences:

1. **Action on the pupil:** It dilates the pupil more rapidly than atropine, but the effects last for only a short time.

2. **Action on the heart:** It makes the heart beat slower. The pulse is therefore slower after hyoscine.

3. **Action on the respiration:** Hyoscine does not increase the breathing as much as atropine does.

4. **Action on the brain:** The activity of the brain is lessened by hyoscine. It produces sleep, by lessening the action of the sensory areas of the brain. Fewer sensory impressions are then received, consciousness is therefore lessened and sleep produced. It lessens especially the remembrance of various sensations. A patient may not remember having seen certain objects or having had pain.

The action of the motor and speech areas of the brain is also lessened. The patient is then less active, less talkative and feels tired.

Occasionally, there is a short period of excitement before the patient falls asleep. He may feel dizzy and be quite active, though the movements are unsteady, and the speech becomes difficult and indistinct.

Excretion

Hyoscine is excreted mainly by the kidneys, more rapidly than atropine, usually in about eight to ten hours.

Tolerance

Patients may get accustomed to hyoscine, so that large doses may be given without producing any effects.

HYPERMETROPIA

Poisonous Effects

The poisonous effects of hyoscine are similar to those of atropine. The patient has the characteristic symptoms of **wild, talkative delirium, dryness of the throat and mouth, dilated pupils, dry red skin, rapid pulse and breathing, etc.**

Uses

Hyoscine is usually given hypodermically, to produce sleep; especially in cases of delirium. mania, delirium tremens, etc. It may cause collapse, however.

Preparations

Hyoscine Hydrobromide; dose $\frac{1}{200}$ to $\frac{1}{100}$ of a grain.
Scopolamine Hydrobromide.

This is the same as hyoscine hydrobromide.

See BELLADONNA.

HYPERMETROPIA

See ACCOMMODATION.

HYPERPITUITARISM

See PITUITARY GLAND, DISEASES OF.

HYPERTHYROIDISM

See THYROID EXTRACT.

HYPNONE

Hypnone is a colorless liquid formed from alcohol. It has a characteristic odor like that of oranges. It produces sleep but it is not very efficient. Dose, 5 to 15 minims.

HYPNOTICS

Hypnotics, soporifics, narcotics, or somnifacients, are drugs which lessen the activity of the brain, and produce sleep, or unconsciousness.

Their effects are similar to those of the general anesthetics, but they are milder, more lasting, and do not relieve pain.

The hypnotics are usually given by the mouth and are slowly absorbed; their effects lasting for several hours.

The chief hypnotics are as follows: Bromides, chloral, sulphonal, trional, tetronal, veronal, paraldehyde, urethane, chloralformamid, chloretone, chloralose, bromural, bromoform, amylene hydrate, hypnone, hedonal, isopral, neuronal, dormiol.

Most of the drugs used as hypnotics are substances of a comparatively complex chemical structure and are slowly absorbed. They are usually given for effects that are to last

HYPODERMIC ADMINISTRATION OF MEDICINE

for several hours. They should be administered in a tumblerful of warm milk or beer, about a half to two hours before the usual bedtime, the actual time depending on the rapidity with which the particular drug is absorbed.

The slow absorption of a substance such as sulphonal may be somewhat increased by giving it in milk well diluted with water.

The nurse should avoid giving chloral in small quantities of water, which tend to cause irritation of the stomach and rapid absorption.

When giving hypnotics by the rectum they should be dissolved in about two ounces of boiled starch and injected into the rectum through a catheter by means of a syringe.

HYPOCHLORHYDRIA

This means lack of hydrochloric acid in the gastric juice.

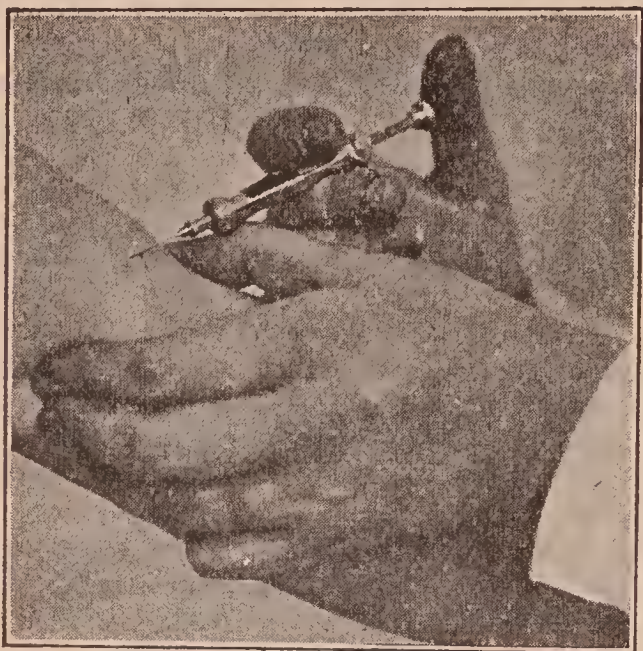
Dietetic Treatment.—The following points must be kept in mind in formulating a dietary for patients suffering from a deficiency of hydrochloric acid: (1) boil the drinking water to destroy any bacteria which may be present; (2) use carbohydrates in the form of starch rather than sugar, since starch is less liable to fermentation from bacteria than sugar; (3) limit the foods which delay the passage of the food mass from the stomach; fats pass into the duodenum more slowly than other foods and when fed with other foods delay their passage materially; (4) avoid the use of soda bicarbonate, as it tends to reduce the normal acid content of the stomach, thus preventing its germicidal action upon the fermentative bacilli; alkaline carbonates likewise inhibit the flow of gastric juices; (5) give especial attention to the attractiveness of the food served; let it be appetizing and savory, for by such means is the appetite juice and incidentally an increased flow of the gastric juices stimulated; (6) condiments and spices, meat broths high in extractives, and salt foods such as caviar and endives may be given at the discretion of the physician; it is seldom advisable to give the foods which are indigestible, even when they act as stimulants to the secretory cells of the stomach.

HYPODERMIC ADMINISTRATION OF MEDICINE

The best sites for hypodermic injection are the front of the thighs, the outer part of the arms and forearms. The skin at the site of injection should be sterilized by rubbing with 50 per cent. alcohol. The sterilized syringe is now filled with a well diluted solution of the drug to be given and held in the right hand with the neck of the syringe resting between the index and middle finger with the thumb on the piston. The skin at the site of injection is then taken

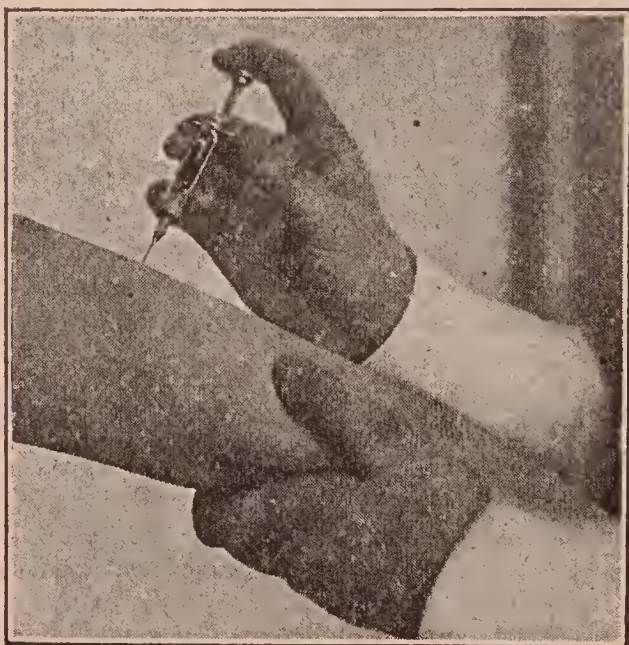
HYPODERMIC ADMINISTRATION OF MEDICINE

between the thumb and index finger of the left hand and the needle inserted under the skin at an angle of about 45 degrees. The place of injection should then be thoroughly massaged.



The correct way to give a hypodermic injection. (Note the direction of the needle.)

(From Blumgarten's Materia Medica)



The wrong way to give a hypodermic injection.

(From Blumgarten's Materia Medica)

HYPODERMOCLYSIS

In giving a hypodermic injection it is very essential to inject the drug *under* the skin, not into the skin. When the drug has been injected into the skin the area of injection looks like goose skin and the needle should be withdrawn and a new place chosen. This should be sterilized and the injection repeated.

The effects of a hypodermic injection usually appear in about ten minutes to a half hour, depending upon the patient's circulation; the better the circulation the more rapid are the effects.

It may also be noted that the more the drug is diluted the better and the more rapid are the effects following a hypodermic injection.

HYPODERMOCLYSIS

Hypodermoclysis is a method of supplying fluid to the body by injecting normal saline, or Locke's solution, into the subcutaneous tissues.

The **therapeutic uses** of a hypodermoclysis are much the same as those described under an intravenous infusion, so need not be repeated.

The **effects of the treatment** are also much the same, the difference being chiefly in the rapidity with which the results are obtained. The fluid injected is rapidly absorbed by the blood vessels, especially after a hemorrhage, with results identical, although not so rapidly obtained as when given by intravenous injection.

The treatment, like an intravenous injection, is *contraindicated* in any form of edema.

The *solutions* used are the same as when given intravenously.

The *temperature* of the solution is 120° F.

The *amount* of solution may be from one to two pints, given slowly.

Site to be Prepared.—The solution may be introduced beneath the skin of the abdomen, below the breast, in the thighs, buttocks, or in the axillary line.

The *articles* required for the treatment will be a rubber dressing sheet, sterile towels to drape the area, disinfectants for the skin, sterile absorbent cotton, the sterile solution, thermometer, flask, tubing (with glass connecting tip to detect air bubbles) and needles. Sometimes injections are made in two places simultaneously; in that case a glass T connecting tip with two short pieces or rubber and two needles will be required. A sterile dressing—a collodion dressing or gauze and adhesive—a paper bag and kidney basin will also be required.

Method of Procedure.—The flask should be held or secured

HYPOPITUITARISM

about two feet above the patient. The doctor connects the sterile tubing, etc., disinfects the skin, and inserts the needles. The nurse's duties are to prepare the patient, to assist the doctor as required, to watch the rate at which the fluid is absorbed, to see that the fluid does not become too low, and as it may run in very slowly, to see that the temperature is maintained. As the fluid enters a slight local swelling develops which disappears as absorption takes place. Very gentle rubbing will aid the absorption.

When this treatment is given, the condition of the patient is frequently critical. The greatest care must be taken to avoid exposure and chilling. The nurse should watch the patient's color and pulse closely.

See INTRAVENOUS INFUSION.

HYPOPITUITARISM

See PITUITARY GLAND, DISEASES OF.

HYSTERECTOMY

See UTERUS.

HYSTERIA

Cause: Uncontrolled nerves often due to overfatigue, or nerve strain, or habitual lack of self-control.

Symptoms: In appearance, the symptoms are rather negative. The body is warm, the color and pulse normal. The patient acts in an uncontrolled way, sometimes grinding the teeth, or thrashing around, and alternately weeping and laughing.

Treatment: Leave the patient unnoticed as much as possible in order that she may get control of herself. Speak sharply to attract attention and divert the mind. Sprinkle cold water or apply a cold sponge to the face. A warm bath often gives immediate relief in such cases, and complete rest is required afterwards as the patient has had a certain amount of strain, both physical and nervous.

(And see PSYCHONEUROSES).

I

ICE-BAG, APPLICATION OF

Method of Filling and Applying an Ice-Bag.—An ice-bag should be fitted to the part and should contain small, smooth pieces of ice or crushed ice only. It should be light in weight and, when used continuously, as in heart diseases, should be suspended to relieve the weight. A bandage, binder, or special suspender should be used to hold it in place and at the same time to relieve the weight. When used for the abdomen or an injured limb it may be suspended from a bed cradle so that it just rests on the part. When used for the head, it may be suspended from the head of the bedstead. The bag should not be more than half full. When filling the bag expel all the air both to lessen the weight and to prevent the ice from melting. If the air is not expelled the bag will not fit and remain in position. When in use, also to lessen the weight, expel the water which forms as the ice melts. See that the bag does not leak.

An ice-cap should never be applied directly to the skin. Lawsuits have been brought against doctors and hospitals because of injuries to the tissues produced in this way. A protector between it and the skin must always be used. Flannel is best because it protects the tissues from the rapid withdrawal of heat, and makes the application less intense, just as flannel protects from the cold in winter better than cotton. Flannel also absorbs the moisture of condensation which forms on the outside of the bag. A cover is necessary to prevent this moisture from wetting the bedding or the patient. The bag must be refilled when necessary so that the temperature of the application will be maintained.

See COLD.

ICE-BOX

Care of Ice-Box and Contents.—The ice-box plays an important rôle in the preservation of the health and comfort of the family, as well as that of the invalid. Therefore the first consideration is the cleanliness of it. The old-fashioned

ICE-COIL

boxes were constructed without ventilation. This was clearly a mistake, since many foods absorb both the odor and flavor of the substances about them if allowed to stand for any great length of time in a closed compartment with them. The ice-boxes or refrigerators of to-day have a ventilation system which insures a circulation of air constantly throughout the interior of the box. The drain pipes require special attention, because no matter how clean the box itself is kept, the melting of the ice causes a slime to accumulate on the inside of the pipe which will clog it and become offensive unless it is flushed out often. This may be accomplished by pouring through it a solution made by dissolving one-half ounce of borax, washing soda, or ammonia in one gallon of boiling water. The adjustable part of the pipe can be removed and cleaned with a long brush made for the purpose. The pipe is then replaced and the boiling water poured through. In this way the entire drainage system of the box is completely cleaned. All loose bits of food which may drop from the containers to the floor and shelves should be carefully removed each day and the interior of the box and shelves thoroughly wiped out. Three times a week is sufficient to wash and flush the box and pipes unless milk, cream, or other food materials have been spilled, in which case it should be washed at once before it has an opportunity to sour or spoil and become offensive. Ice should always be washed off before being put in the box, and all milk and cream bottles should likewise be wiped with a clean wet cloth before being placed on the ice.

Hot food must never be put in the ice-box, as the heat from the food will raise the temperature of the air in it. In some cases the sudden chilling of the food itself is undesirable, but this is not so often the case. However, the best results are obtained by first allowing the food to cool, and then placing it on ice. This is particularly the case with jellies made from gelatin.

ICE-COIL

The ice-coil is a convenient substitute for the ice-bag when cold is to be applied continuously. It is lighter, more pliable, may be more easily fitted to the part and the temperature can be kept constant. It consists of a flat coil of rubber tubing, with two loose ends about two yards long, through which cold water is passed.

Conditions in which the Ice-Coil is most Commonly Used.—1. Applied to the head in fevers, meningitis, cerebral hemorrhage and conditions accompanied by cerebral congestion to contract the blood vessels, check bleeding, inflammation and congestion, and to act as a sedative in delirium.

ICHTHYOL

2. Applied to the chest in hemoptysis, pleurisy and pneumonia to check bleeding, inflammation, and congestion; to relieve pain, dyspnea and coughing, and to calm an irritable heart and slow the pulse in pneumonia. It stimulates vital nerve centers, relieves toxemia, and lowers the temperature.

3. Applied to the left side of the chest in endocarditis, in pericarditis, and in fevers, such as typhoid and pneumonia, with a rapid, bounding pulse.

Method of Application.—When an ice-coil is to be applied a bucket containing water and ice is placed on a chair or stand at the side of the bed. The ice should be covered with gauze to prevent any particles from the melting ice from clogging the tubing. A second bucket or pail is placed on the floor or on a low stool for the return flow. The air may be expelled and suction created in the tubing by first attaching a funnel to the end through which the water enters and pouring water through. Before it has all quite run through, the end of the tube should be placed in the water in the bucket on the stand. The ice water should then run continuously. The water in the pail on the floor may be poured back into the bucket and kept at the right temperature by adding ice to it. Sometimes instead of a bucket and flow of water by siphonage, a water cooler is used from which water flows by gravity.

Preparation of the Patient.—As in all cold applications, the patient's feet and body must be warm and the application must not be allowed to cause prolonged chilly sensations. The area to which the cold is applied should be warm before the application is made. To protect the skin from the intense cold, a moist compress is placed between it and the coil. The skin must be closely watched for discoloration and numbness.

ICHTHYOL

Ichthyol is a dark brown, oily looking sulphur compound soluble in water and oils, but not in alcohol. Its therapeutic value depends largely upon the sulphur ingredient.

It is used as a counterirritant either in the form of an ointment (10 to 50 per cent.) or as a 50 per cent. solution.

Conditions and Purposes for which Ichthyol is Used.—

1. In acute articular rheumatism to relieve pain, tenderness and stiffness. Ichthyol ointment may be smeared over the inflamed part or spread on lint, which is then wrapped about the joint. After the acute stage has passed the ointment may be rubbed in.

2. In acute sprains and swollen glands to lessen pain and swelling.

IDIOSYNCRASY

3. In erysipelas and chronic skin diseases such as acne and eczema.

4. In burns, sunburn, frostbites, and chilblains, corns and bunions, to relieve pain and swelling.

5. In boils or carbuncles, bedsores and other sloughing or infected areas to promote the absorption of waste products and stimulate healing. It is thought to favor local resistance by promoting a local leucocytosis.

In pelvic inflammation with an inflammatory exudate and vaginal discharge. A tampon or gauze saturated with the solution is inserted in the vagina.

The Method of Application.—Ichthyol is seldom applied by rubbing. It is usually painted or smeared over the part with a cotton swab or camel's-hair brush. It may be applied to lint or gauze which is placed over the part. In any case it should be covered by a dressing lightly but securely fastened in place in order to prevent staining of the bed linen, etc. Ichthyol is usually applied in the form of an ointment. Ichthyol alone is soluble in water and so is easily removed from linen but when mixed with vaselin, the oil fixes the stain, prevents its removal, and so leaves a very unsightly stain. A preparation of ichthyol and collodion is sometimes used for corns and bunions, etc. It does not stain.

IDIOSYNCRASY

Some individuals get unusual, opposite, even poisonous effects from ordinary doses of certain drugs. Occasionally even large doses of certain drugs produce no appreciable effects. Such effects are called **idiosyncrasies or untoward effects**. They occur in two forms:

(a) **Idiosyncrasy of Effect:** This is a condition when small or ordinary doses of a drug cause no effects, unusual, opposite or poisonous effects. For example, morphine is a drug which usually produces sleep and quiets the patient. In some individuals it causes excitement and wakefulness.

(b) **Idiosyncrasy of Dose:** This is a condition where even large doses of a drug cause no effects at all.

ILLUSIONS

Illusions are misinterpreted sense impressions. There is always an external stimulus to furnish the impression, but it is interpreted falsely, as for example, the cord of a bath robe which is detached from the garment may be interpreted to be a snake, or the branch of a tree swaying in the wind may be mistaken for a beckoning hand, or the sound of a whistle may mean the call of a human voice. The normal mind at times misinterprets sense impressions, but it soon corrects the error. In mental disease the illusion per-

IMMUNITY

sists, is believed in and consequently influences behavior. There may be illusions of all the senses, but those of hearing, sight and touch are most frequent.

IMMUNITY

Immunity to a disease may be defined as a condition of the body such that the germs of that disease will not develop in the body or, if the germs do develop, the poisons they secrete will not injure the body.

The possession by certain species of animals of immunity to diseases affecting other species has long been recognized; for instance, horses do not take measles. So also has the possession by certain individuals of an immunity not shared generally by others of the same species; for instance, many persons will not take diphtheria.

The explanation offered to-day is briefly this—such immunity is due to manufacture by the body of antidotal substances, sometimes directed against the germ, sometimes against the poisons, but in either instance eliminating the harmful effects.

The presence of the antidotal body may be congenital (born with the person), constituting "*natural immunity*"; or may be "*acquired*" in several ways in later life; by an attack of the disease, as in measles; by the artificial implantation of a living germ (virus) as in small-pox; by the artificial injection of a dead germ (vaccine) as in typhoid fever; or by the artificial injection of a germ-poison (toxin) as in immunizing horses against diphtheria in order to produce antitoxin.

All these methods stir up the body to make its own antidote, and hence the immunity thus obtained is known as "*active immunity*." Such immunity is generally as strong and as lasting as can be had under the present state of our knowledge.

If, however, instead of using a germ or a germ-product to stir up the body to make its own antidote, we borrow enough ready-made antidote to confer immunity from another body already immunized, already in possession of the antidote, the immunity thus conferred is known as "*passive immunity*." Such borrowed immunity is of inestimable service in the treatment of diphtheria, where the blood serum containing the antitoxin is borrowed from an immunized horse; and it has been successful in pneumonia and in poliomyelitis, where the blood serum containing the antidotal substance is borrowed from previous patients who have recovered; their recovery being evidence that they have manufactured considerable quantities of the antidote themselves.

But since it is borrowed, since it is not the result of a

IMPETIGO CONTAGIOSA

stirring up to make its own antidote of the body on whose behalf it is borrowed, such passive immunity, while invaluable for the moment in meeting the acute exigency due to the poisoning from which the patient is already suffering, does not last; it does not confer an active immunity such as would be conferred if that body had succeeded in learning to make its own antidote.

See INFECTIOUS DISEASES, COURSE OF; and SERUMS.

IMPETIGO CONTAGIOSA

See SKIN DISEASES.

IMPULSIVENESS

Impulsiveness is shown by sudden acts which are the responses to uncontrollable thoughts or feelings. These responses are in no way premeditated, for the idea barely comes into consciousness and is immediately transformed into action without thought of the consequences. Unprovoked attacks upon other patients and upon the nurses are frequently of this nature, as also are the hazardous and dangerous activities to which the patient is impelled frequently by hallucinations.

INDIAN HEMP

See CANNABIS INDICA.

INDICAN, TEST FOR

See URINE.

INFANT, CARE OF

A healthy infant should spend the first few weeks of its life in sleeping and feeding. Habits begin to be acquired from the first day, and it is most essential for the welfare of the child, as well as for the comfort of the mother and other members of the household, that from the very outset the child should be trained to the utmost regularity in regard to its sleeping and its meals. Disregard of this point in respect of feeding has been well said to be sowing the "wind," and is certainly followed by reaping the whirlwind!

The child should be put to the breast three or four times the first day. This teaches the child to suck, and it swallows some colostrum which has a beneficial laxative effect upon it. After the milk comes, the child should be put to the breast regularly every two hours during the day and every three hours at night. The most usually convenient hours are 8, 10, 12 noon, 2, 4, 6, 8, 11, P.M., and 2 and 5 A.M. The breasts should be used alternately, and great care must be

INFANT, CARE OF

taken to preserve the nipples from cracking. They should be wiped with a clean handkerchief dipped in sterile water before each feed, and, after the feeding is done, should be lightly smeared with boroglyceride, or boracic solution. The child's mouth should be wiped out at the same time and in the same way to avoid the occurrence of thrush.

In the first two days before the milk is secreted, the child should be given occasionally a teaspoonful of warm sterilized water, preferably without sugar.

The infant loses several ounces in weight during these two days without food, but by the end of the first week it should have made them up again, and be the same weight as at its birth. After that it should put on from 5 to 7 ounces a week, and this should be checked by its being weighed once a week regularly.

A healthy infant has about four to six movements of the bowels in the twenty-four hours, and urinates about twice as often.

The cord must be kept strictly aseptic. It must be carefully dried after each bath, powdered if necessary, and dressed in sterile gauze or lint. After the cord drops off, the umbilical scar should be dressed in the same way, no pads being used, but merely a piece of aseptic dressing kept in place by the binder.

In fine weather the child may be taken out on the third or fourth day, and may with great advantage be trained to sleep outside. In winter the first outing should be delayed until a favorable day occurs.

Management of Premature Infants.—A premature infant has difficulty in maintaining its body heat. It is therefore imperative to keep it warm, without at the same time overheating it. This is best done by keeping the child in an incubator in which the temperature can be kept at about 78° F. with more or less exactitude. Failing such conveniences much may be done by wrapping the child in cotton wool, and keeping its cot near the fire, and free from draughts in a room with a temperature of 72° F. The infant should not be bathed, but merely smeared with warm olive or neat's-foot oil, care being taken to keep it warm during the process. The feeding requires the greatest care and patience. The stomach is very small and the child may be too weak to suck. If so, it must be fed with a small teaspoon or a glass pipette very slowly. It is of the first importance that it should be fed on breast milk, with, perhaps, the addition of a little peptonized whey. The feeds should be given every hour or so, and should be started very soon after birth. If at this time there is not even colostrum in the mother's breast, some peptonized whey must be given

INFANT FEEDING

until the breast is available. At the same time fluid should be supplied by one or two enemata of half an ounce of normal saline solution daily. As soon as the child can suck it should be put to the breast, or else the milk drawn off and fed through a rubber teat. The enemata may be discontinued after feeding is thoroughly well established.

INFANT FEEDING

In all cases an infant should be suckled by its mother unless definite contra-indications exist. If the advantages to the child and to herself are laid before the mother, few women will refuse the privilege. For the infant it is the natural and ideal food, alike in its composition and in its freedom from contamination. For the mother it is an advantage in that it stimulates the processes of involution of the uterus. Even a few weeks of breast-feeding give the child's digestion a good start, and fit it for subsequent artificial feeding if the lactation becomes a strain to the mother.

The simple rules for breast-feeding have already been given (see INFANT, CARE OF). It is only necessary to insist again on the paramount importance of regularity in the times of the feeds.

Contra-indications to Breast-feeding.—The following maternal conditions make suckling undesirable:

1. Tuberculosis, either active or latent.
2. Chorea.
3. Serious complications during or after labor, *e.g.*, hemorrhage, septic infection, eclampsia.
4. Absence of milk.
5. The occurrence of pregnancy during lactation.
6. Acute illness occurring during lactation.

On the part of the infant, contra-indications to the continuance of breast-feeding are:

1. Continuous loss of weight.
2. Persistent and intractable indigestion.

In such cases the infant must either be fed by a wet nurse or else be placed wholly or in part upon artificial feeding.

Wet Nursing.—This is the best substitute for the milk of the child's own mother. It is, however, a very expensive method, and with the improvements in our knowledge and methods of bottle-feeding it has gone greatly out of fashion. If it is decided to wet nurse the child, it is the physician's duty to choose the nurse. This is a matter of great importance, as tubercle and syphilis may be transmitted to a child by the milk. The foster mother should be a woman between twenty and thirty, and her own child should be very little older than the infant to be nursed.

INFANT FEEDING

She must be carefully examined for evidences of disease, the throat, tongue, teeth, skin, and hair being inspected. The breasts and nipples must also be examined. Her own infant should be seen and examined for signs of syphilis or other disease. The greatest care must be exercised in every way, and in cases of doubt the Wassermann test for syphilis should unhesitatingly be applied.

Mixed Feeding.—Where the supply of mother's milk is insufficient, artificial feeding may be substituted several times in the twenty-four hours, without putting the child wholly on the bottle. This mixed breast and artificial feeding is superior to entire artificial feeding, and infants thrive on it. The bottles may be substituted at whatever times are most convenient, but the process of substitution should be gradual, one bottle being given to start with, and afterwards the number gradually increased if desired.

Artificial Feeding.—In this country cow's milk is the most convenient substitute for breast milk. The comparative composition of the two milks is as follows:

<i>Composition.</i>	<i>Breast Milk</i>	<i>Cow's Milk</i>
	<i>Per cent.</i>	<i>Per cent.</i>
Proteid—		
Casein and Lactalbumen.....	1.5	3.5
Fat	4	4
Carbohydrate (sugar)	7	5
Mineral salts	0.2	0.7
Water	87	87

From a study of this table it will be seen that cow's milk differs from breast milk in having too much proteid and too little carbohydrate. There is, however, an even more important difference in the nature of the proteid. In both it consists principally of casein and lactalbumen, the former of which is converted by the rennet of the stomach into a solid curd, while the latter remains practically fluid, and is therefore much more easily digested. In breast milk more than half the proteid is in the form of lactalbumen, while the casein forms a fine curd with the rennet. In cow's milk, on the other hand, the greater part of the proteid is in the form of a casein which forms a dense curd with rennet, and only about one-fifth part consists of lactalbumen.

Cow's milk must, therefore, be diluted before it becomes suitable for the infant. But here again we are met with a difficulty, for mere dilution not only does not affect the nature or the relative proportion of the two forms of the proteid, but it brings the proportion of fat and carbohydrate

INFANT FEEDING

below what it ought to be. To make a suitable mixture with cow's milk, we must not only dilute it, but add to it fat and carbohydrate—usually in the forms of cream and sugar of milk.

Rules for Artificial Feeding during the first Two Months.

—During the first two days a child that is to be artificially fed should get but little nourishment, for nature does not provide any milk during these days, and it is well to follow the natural plan as closely as possible. A little warm sterilized water with a small pinch of sugar of milk may be given occasionally on the second day, and on the third day it may be given one or two teaspoonfuls of a mixture of milk and water in the proportion of one to ten, with a little sugar of milk. On the third day a regular and definite plan of feeding should be adopted. The important points are the times, quantity, and composition of the feeds.

Times.—These should be the same as for breast-feeding, and should be adhered to strictly (see INFANT, CARE OF).

Quantity.—Some variation must be made for the size of the child, but for an infant of average size a feed should not be more than one ounce during the first ten days. It may then be gradually increased, so that at the end of the first month it is two ounces, and at the end of the second month three ounces. If a healthy infant is given too large a feed, it generally indicates the fact by vomiting some of it shortly afterwards.

Composition.—Details of the various methods of artificial feeding are to be found in books on the subject, and all that is necessary here is a sketch of a simple and thoroughly serviceable plan of feeding for the first eight weeks.

(a) Mixture to be given from the Third to the Tenth Day.

Milk	$\frac{1}{2}$ tablespoonful.
Sugar of milk	$\frac{1}{4}$ teaspoonful.
Water	$1\frac{1}{2}$ tablespoonfuls.

Dissolve the sugar of milk in the water before adding the milk. Scald the mixture before use. Give every two hours during the day and twice at night.

Gradually increase the quantities of the ingredients every third day, so that at the tenth day the mixture is as below:

(b) Mixture to be given from the Tenth Day.

Milk	$\frac{1}{2}$ to $\frac{3}{4}$ tablespoonful.
Sugar of milk	$\frac{1}{2}$ teaspoonful.
Cream	$\frac{1}{2}$ teaspoonful.
Water	$1\frac{1}{2}$ tablespoonfuls.

Again gradually increase the ingredients until at the beginning of the second month the mixture is as follows:

INFANT FEEDING

(c) *Mixture to be given from the Beginning of the Second Month.*

Milk	1½	tablespoonfuls.
Sugar of milk	¾	teaspoonful.
Cream	1	teaspoonful.
Water	2½	tablespoonfuls.

Gradually increase the intervals between the feeds, so that at the end of the second month the infant is being fed every two and a half hours during the day, and only once at night if possible.

Gradually increase the ingredients so that at the end of the second month the mixture is as follows:

(d) *Mixture to be given from the Beginning of the Third Month.*

Milk	2½ to 3	tablespoonfuls.
Sugar of milk	1	teaspoonful.
Cream	2	teaspoonfuls.
Water	3	tablespoonfuls.

Temperature.—In all cases the temperature of the mixture should be 100° F.

Use of Lime-Water, Barley Water, etc.—Nurses and mothers are fond of adding barley water to the mixtures because it makes them look more nutritious. An infant cannot, however, digest starchy matter, so that the barley passes through unaffected, and is apt to set up irritation. The same applies to oatmeal water. Lime-water has the effect of making the curd finer and lighter, and so making the mixture more digestible. It has also a constipating effect. While, therefore, there are not the same objections to its use as to the use of barley water, it should not be given unless the child seems unable to digest the plain mixture, or there is some diarrhea. It should be given in the proportion of a tablespoonful to three ounces of the mixture. Citrate of soda added to the mixture has the effect of preventing the formation of curd, the milk remaining fluid. This is of value where the infant is unable to digest the curd. The citrate is conveniently added in the form of a solution in distilled water, two grains of citrate being required for each ounce of milk.

The Bottle.—The old-fashioned bottle with a long rubber tube is a perfect abomination, as it is impossible to keep it clean. There is also a tendency amongst busy working women to place such a bottle in the cot beside the child, and let it take its meals when it feels inclined. This always leads to indigestion and bad health sooner or later. Practically

INFANT FEEDING

all modern bottles have simply a teat, which can be easily and quickly cleansed and sterilized. The hole in the teat should be of a size to allow the milk to drop out rapidly on inverting the bottle, but not actually to run out. Both teat and bottle must be kept absolutely clean. The former should be turned inside out and washed, and the latter brushed out immediately after use, and both kept in a basin of boiled water till again needed. At frequent intervals they should be sterilized by scalding. Under no circumstances should the milk be allowed to remain in the bottle for the next feed.

The Question of Sterilization.—One of the greatest advantages of breast milk is that the infant receives it direct from the nipple, and it is therefore sterile. Cow's milk obtained even under the best circumstances is far from sterile, and under ordinary town conditions the number and variety of organisms found in it are truly appalling. The rarity with which breast-fed children are attacked with serious diarrhea is very significant, when we consider that amongst bottle-fed children epidemic diarrhea is a scourge. It is believed also that tuberculosis is frequently conveyed to the infant by infected milk; and outbreaks of scarlet fever and diphtheria are often to be traced to the same source.

The advantages of sterilizing the milk would therefore seem to be overwhelming. But it is only right to state that there are disadvantages also. Boiling the milk spoils its taste, and, while that is a detail to an infant that is brought up on it from its birth, it has a more serious influence in destroying some valuable ferments in the milk. The continued absence of these ferments sometimes leads to infantile scurvy.

This disadvantage of sterilization can be circumvented without the sacrifice of the advantages by the process of "scalding." The milk is brought to the boiling point and kept at that temperature for two minutes and then cooled rapidly. This is simple and effective in that it destroys all organisms, although the spores of organisms may survive. "Pasteurization" is also satisfactory, but more complicated. In this process the milk is brought to a temperature of 158° F. and kept there for twenty minutes. A drawback is that the tubercle bacillus may survive the process.

Patent Foods.—Speaking generally, patent foods are never so good as a simple milk and cream and water mixture, and if the rules as to the times, quantity, and method of preparation are carefully attended to, few infants will fail to thrive on it. The advantage of foods is that the rules are all printed on the bottle or tin, and command attention, whereas the physician as often as not does not even write down the

INFECTIOUS DISEASES

rules, but contents himself with a few verbal instructions, which are soon forgotten.

Most patent foods contain starchy material which the infant is unable to digest, along with an excess of sugar which makes it fat but flabby, and too little real fat.

INFECTIOUS DISEASES, COURSE OF

Although each infectious disease has its own peculiarities, by which it can be recognized, yet all show a certain family resemblance, present a more or less similar history, follow a more or less similar course, spread by more or less similar means, inflict more or less similar damage, and can be combated by more or less similar procedures; while nearly all of them confer one (very costly) boon, a more or less complete immunity to a subsequent attack of the same disease.

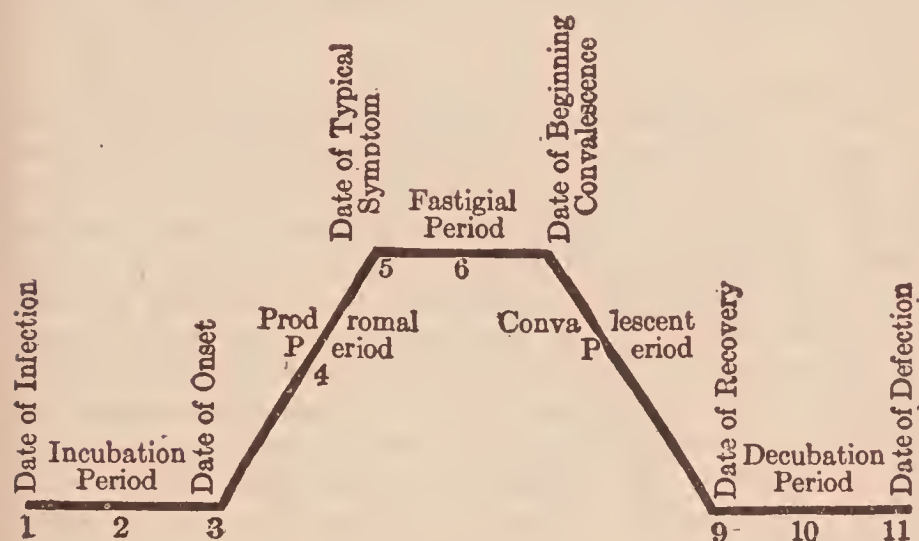


Diagram of the General Course of an Infectious Disease

- 1 = date of entry of germs to body;
corresponds with 11 = date of exit of germs from the body.
- 2 = period of increase of germs;
corresponds with 10 = period of decrease of germs.
- 3 = date of first symptoms;
corresponds with 9 = date of last symptoms.
- 4 = period of increasing illness;
corresponds with 10 = period of decrease of germs.
- 5 = date of symptom characteristic of the disease in question;
corresponds with 7 = date of symptoms beginning to vanish.
- 6 = period of height of the disease.

INFECTIOUS DISEASES

One of the many points which our ordinary infectious diseases have in common, is this—each depends absolutely for its appearance on the same essential, the introduction, to the body, of the germ of that particular disease. As you cannot produce strychnine poisoning by swallowing opium, as you cannot produce opium poisoning by swallowing strychnine, so you cannot contract diphtheria, except from the diphtheria germ, or tuberculosis except from the tuberculosis germ.

Since no infectious diseases can develop until the germ of that disease enters the body, the study begins with that entry to the body, however the entry may be effected. The day on which this entry occurs is known as the **date of infection**. The history of the disease in that particular body begins then. The disease itself does not at once show itself, however. An interval, known as the **incubation period**, intervenes between infection and the actual development of the illness.

The actual date of infection cannot by any means always be surely determined in every individual case. When the patient comes to the physician he is usually already ill, else he would not have come. The date of the entry of the infection must, therefore, in such instances, be established by inquiry directed to determining when he was in contact with some other person, sometimes with an animal, showing similar symptoms, or at least, similarly infected; or was otherwise exposed. In very many instances it will be discovered that the present patient was in contact with such a source of infection for several days, a week, or a month, before becoming ill himself, and it is then impossible to decide absolutely on what particular day the poison entered his body first.

But now and then the opportunity arises to decide the date of infection absolutely, as when a well child visits for one day another child, who is sick, and then develops a similar attack later on.

The date of infection then, determined as above, marks the beginning of a period during which the patient, although he has within him the germ or seed of the disease, which will later sprout up so to speak, is just as well as ever.

The **period of incubation**, then, is the period between the date of infection and the date of the earliest symptoms. The patient is quite well during this period—is not, in fact, a patient yet, but only a potential patient. Indeed, he may never develop the disease at all. During this period of incubation, the potential patient, in some diseases, and despite the fact that he is not yet sick in any way, is infec-

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tious; that is, he may give to others the disease germs he is carrying about with him. This is true of diphtheria, of typhoid fever, of cholera, and some others. But the potential patient, during the incubation period, is not infectious in other diseases—for instance, in small-pox, chicken-pox, measles, German measles, scarlet fever, the patient is, in the incubation period, harmless to others, and remains harmless all through the incubation period right up to the time when the first symptoms appear.

The person infected with diphtheria, typhoid, cholera, but not yet sick (perhaps he may never become sick), is, and may a long time remain, infectious. Such persons are called **carriers**, which means well persons who are infected, who can give the germs of disease they carry to others, yet are not sick, and may never, perhaps, become sick. Because they are infected they are dangerous: if they do not become sick they are doubly dangerous; for if they become sick, the presence of the infection may be recognized and they may be isolated, while if they do not become sick they may go on for days, weeks, months or years, infecting other people, but unrecognized as the source of the infection.

Returning to the consideration of the ordinary course, we find that, marking the end of the normal incubation period, comes the date of earliest symptoms. The patient is now upset, feels sick. If he is seen at this early stage, all that usually can be certainly determined at once is that he is sick; what germ is responsible cannot yet be definitely settled from his symptoms because there is as yet usually no definite differentiation of the symptoms. He "is sickening for" something, as the phrase goes, but for what is not yet usually determinable absolutely. Nearly every slight ailment due to infection, as well as nearly every serious one, begins in this way and cannot be differentiated with certainty at this stage from the symptoms alone.

This date of first symptoms is also called, for obvious reasons, the **date of onset**. The patient is infectious at this stage in almost all our infectious diseases. In diphtheria, typhoid, cholera, he has been infectious from the earlier date of infection, but in many of the other diseases of this part of the world, the infectiousness begins at this date of onset. When a patient of this latter group becomes sick and is promptly isolated, the damage he has done in infecting others is confined to what he has done since he became sick, an interval which can be reduced by watchfulness and prompt isolation to a few hours, or, at most, a day. But in the former group, since the patients are infectious during the whole of the incubation period and are also well during this period, the damage they may do before becoming sick is

INFECTIOUS DISEASES

the damage done during days or even weeks of infectiousness preceding any possible recognition of their condition as being dangerous at all, so far as symptoms go.

This **date of earliest symptoms, or date of onset**, ends the incubation period and ushers in a new period, the **period of prodromal symptoms**, or more shortly, of prodromes; that is, of symptoms preceding the fully developed, fully recognizable, fully differentiated disease.

The prodromal period ends with the development of some striking symptom, typical of the particular disease from which the patient is suffering. This **typical symptom** is a rash in measles, German measles, scarlet fever; a membrane in diphtheria; a swelling of the face in mumps; an eruption in smallpox and chicken pox, and so on.

Between, then, the date of onset and the date of the appearance of the typical symptoms we have a **period of prodromes**, in which the initial fever, headache, digestive upset, general feeling of sickness, more or less common to all these infections, grow worse. The length of the prodromal period is itself one of the best differential signs because the prodromal periods vary for each disease, just as the incubation periods do.

When the typical symptom has appeared—the eruption, rash, or whatever it may be—the disease passes into the third period or **fastigium**. This is the stage that the general public recognizes.

The **fastigium** or **fastigial period** begins with the appearance of the typical symptom. It continues to the beginning of convalescence—a date which in some diseases is sharp cut and definite, as in pneumonia, where the temperature may drop from 104 degrees to normal in 24 hours; but which in other diseases is a shadowy period rather than a date.

The period of the fastigium is in most diseases an infectious period—and in most diseases it was the only period recognized as infectious until quite recent years. The length of this period varies a good deal. Convalescence may be delayed by complications, relapses, etc. Yet in general the fastigial period has a more or less definite length in each disease; about one week in diphtheria, about three weeks in typhoid fever, and so on.

The date of the **beginning of convalescence** ushers in the **convalescent period**, which ends with the date of complete recovery—a date somewhat indefinite, of course, and yet which can be fixed approximately from temperature and other records. This **period of convalescence** is very variable in different diseases and is by no means constant in any disease. Infectiousness continues during convalescence in

INFECTIOUS DISEASES

almost all diseases. It is a peculiarly dangerous period because the stress and strain of the fastigial period is relaxed, the patient is able to "sit up and take notice," he feels lonely and wants to see friends and relatives, who are themselves anxious to see the patient, to kiss the patient, condole with him, etc. Moreover, the improvement in the patient's physical condition is usually construed subconsciously to mean a lessening of the danger of infection from him. But this idea is just as mistaken as is the idea that the prodromal period is not dangerous.

It is obvious that the **convalescent period** is the converse of the prodromal period; the patient is growing better, rather than worse, the disease is lessening, not increasing. But this does not affect the question of infection. There are few exceptions to the rule that the patient is infectious from the moment the very first symptom of the disease has appeared up to the moment when the very last symptom has disappeared.

But even on complete cessation of the symptoms, the history of the disease in that patient is not necessarily complete. This is particularly true of diphtheria, typhoid fever and cholera. *Preceding the appearance of the earliest symptom* was the incubation period, during which the germs introduced at the date of infection were increasing in number, this increase resulting in the appearance of the first symptom itself. The potential patient is well but infectious.

But now *following the disappearance of the last symptom*, we have a converse period, in which the germs are decreasing in number, this decrease ending normally with their final complete disappearance. Matching the term given the first stage, incubation, indicating an increase of the germs, Hill has suggested for this last stage, the term **decubation**, indicating a decrease in the germs. Matching the term, infection, for the first entry of the germs, he has suggested the term, **defection**, for their final exit.

The **decubation period** then extends from the date of final recovery of the patient to the date of final exit of the germs from the body—from complete recovery to defection.

The patient is well during this decubation stage, just as he is in the incubation stage. Moreover, just as he is infectious in some diseases during incubation, notably in typhoid, diphtheria and cholera so he is infectious during decubation in the same diseases. Just as he is noninfectious during incubation in many other diseases, so he is noninfectious during decubation in these other diseases.

How long is the decubation period? While there are, no doubt, certain average lengths for each disease, yet we

INFLAMMATION OF BREAST

know also that the decubation period varies even in the same disease very much. Thus in diphtheria it probably averages about two weeks; yet it has been prolonged to nineteen months, and it is not infrequently six to ten weeks long. In typhoid fever the average decubation period is probably a month, but there is on record at least one case in which it lasted 54 years.

Just as persons who, never having had the disease, may become infected and so enter the incubation stage, but may never develop the earliest symptoms, remaining infectious, nevertheless, for shorter or longer periods, or even for their whole remaining lives, so persons who have had the disease and have recovered from it, thus going into the decubation stage, may never reach defection—i. e., the germ may continue in their bodies and render them infectious for long periods or even for the rest of their lives.

The patient who has recovered entirely from an attack of an infectious disease is, to all appearance, just the same individual as he was before, whether he continues infectious or not. But really he is profoundly different. One of the ways in which he may be different has just been outlined—if he remains infectious after recovery, he is now a menace to all nonimmune associates, as he was not, before he had the disease. But whether he is infectious or not, the recovered patient is almost always different in another way—he cannot again suffer (for a time at least) from the same disease. In brief, the attack has more or less immunized him to similar attacks. The immunity may be lifelong, as in smallpox, or only a few months long, as in diphtheria; and actual tests can demonstrate the presence of the protective agent in the blood in some diseases, notably in diphtheria. This immunity to an infectious disease is as specific as the germ. No disease immunizes the patient against any other disease, but only against itself. Thus, scarlet fever immunizes only against scarlet fever, diphtheria only against diphtheria, real measles only against real measles, and so on.

INFLAMMATION OF BREAST

See MASTITIS.

INFUSIONS

Infusions are preparations of plant drugs made by pouring hot or cold water over them, and then allowing the drug to steep. The strength of an infusion depends on the quantity of drug used to a definite amount of water.

INSANITY

INSANITY

General Classification

I. Organic Group

Senile psychoses.
Psychoses with cerebral arteriosclerosis.
General paralysis.
Psychoses with cerebral syphilis.
Traumatic psychoses.
Psychoses with brain tumor.
Psychoses with Huntington's chorea and other brain or nervous diseases.

II. Toxic Group

Intoxication psychoses due to alcohol and drugs.
Autotoxic psychoses.

III. Somatic Disease Group

Infective psychoses.
Exhaustive psychoses.

IV. Constitutional Group

Manic-depressive psychoses.
Involution melancholia.
Dementia præcox.
Paranoia.
Epilepsy.
Psychoneuroses.
Mental deficiency.

INSANITY

Legal Aspects

Insanity, meaning "unsoundness," is a term applied by the courts of law to conditions of mental derangement, and has been adopted generally to include all forms of mental illness. It is, therefore, a legal and social term and not a medical one. From the medical standpoint no definition of insanity is possible, for a person mentally ill may be entirely competent according to the Statutes which provide that the test of competency is the person's fitness to attend to the ordinary common affairs of life. The mental activity may be perverted or disordered in only one particular field, or limited to a single subject as shown by the impulse to do certain acts or by a particular delusion, and at the same time the patient may be quite capable of transacting business and be rational in all other ways.

It is only when mental disease disables socially, when the individual is unable to adequately cope with his environment and is incapable of making the ordinary adjustments

INSOLATION

in domestic, social and business relations, or commits an illegal act that the question of insanity is raised and his responsibility must be determined.

Responsibility has been held by the courts to mean that "the person is able beyond doubt to comprehend the nature and consequences of his acts, and has sufficient power of will to overcome impulses to commit crime."

INSOLATION

See SUNSTROKE.

INTERTRIGO

See SKIN DISEASES.

INTESTINAL OBSTRUCTION

This is a condition in which the normal passage through the intestinal tract is interfered with, either partially or completely. The symptoms naturally will vary according to the locality of the obstruction. If it is high up, near the duodenum, vomiting is an early symptom; if low in the ileum, distention is more marked.

Treatment.—Immediately after a diagnosis of intestinal obstruction, an exploratory celiotomy is performed with the hope of finding the cause of the obstruction and relieving it.

Ante-operative Treatment.—In all cases of intestinal obstruction it is very essential that the stomach be washed just before giving the anesthetic. This will save a great deal of annoyance later, because the danger of aspirating the foul materials stored in the stomach is reduced to the minimum. If the patient is very weak or greatly shocked it is advisable to administer the clysis of saline either before the operation or at the same time the operation is being performed.

Operation.—Inasmuch as the actual surgical conditions in most cases of intestinal obstruction are not diagnosed until the operation, the operating room nurse should be ready at a moment's notice for anything from an *enterostomy* to an extensive resection. Since these operations demand a complete exploration, there should always be on hand plenty of pads and hot saline to care for the intestines as they are brought out from the peritoneal cavity. If, after the obstructive element has been found and removed, the distention is still great to the point of paralysis of the smooth muscle of the intestine, an *enterostomy* might be performed. This is an incision into the bowel for the purpose of inserting therein an L-shaped glass tube known as a Paul's tube, or a simple rubber one. The open end of the glass is connected with rubber tubing which drains into a bottle pro-

INTESTINES, DISEASES OF

vided for the escape of the intestinal contents. This operation practically amounts to the formation of an artificial anus.

Post-operative Treatment.—If an enterostomy has been done, the treatment is the same as that prescribed following intestinal injuries. If the tube has been placed in a high portion of the jejunum, peptonized milk, beaten egg and other nutritive fluids may be introduced through it via a catheter entering the descending loop of gut; the original enterostomy tube should be temporarily clamped after the feeding has been introduced. It is very important that these cases should be given plenty of fluid either hypodermically, rectally, or by infusion. The skin about the enterostomy opening should be well protected against the irritating influences of the intestinal contents either by albolinated gauze or Beck's paste.

INTESTINES, NURSING IN DISEASES OF

Recognize the fact that intestinal disorders are apt to be accompanied by mental depression, and make the counteracting of this one of your objective points. Use your knowledge of food values and metabolic requirement and with keen realization of the intestinal weakness of the tract on which you are working; select the foods which will harbor, not overtax, its strength. Watch all excreta for clues. Remember that the care of the teeth and the tongue are important details. Encourage the kidneys to assist in cleansing system by giving plenty of water to drink unless fluids are restricted; but never give ice water.

Visualize the intestinal anatomy and be certain that external applications cover exactly the point you intend to treat and that they are held in the correct position as shall, with the least discomfort to your patient, bring the result for which you are working.

External applications should be light in weight, kept uniform in temperature, hot or cold as ordered, never lukewarm. After removing them, cover the skin with soft, warmed flannel to preserve the temperature that has been attained.

Rectal and colonic treatment should be preceded by introducing a well lubricated tube for the liberation of gas. This will often prevent the expulsion of the solution to be retained, such as the stimulating or nutritive enemata, and lessen the pain of the further introduction of solutions. Lubricate your tubes well, expel air, introduce slowly and without force, allowing an even, gentle flow regulated by the height of your container above the buttocks.

Remember your object in giving the treatment:—if it is for continuous heat, watch the temperature of the water, and

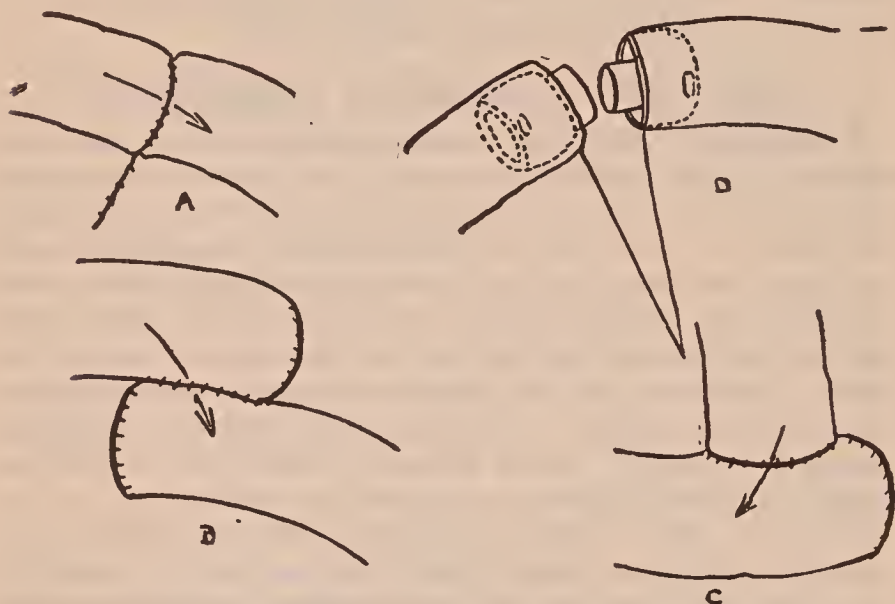
INTESTINES, SURGICAL CONDITIONS OF

conserve your patient's strength, so that you may continue the treatment until you have the desired result; if it is for nourishment, mix so carefully and administer so slowly that you accomplish the thing your patient needs.

Make your notes of value by observing and charting every detail accurately and concisely.

INTESTINES, SURGICAL CONDITIONS OF

There are many diseases affecting the intestines but the interesting ones from a surgical standpoint are those resulting in perforations and new growths. The intestines may be the seat of perforation as the result of typhoid, or



Types of intestinal anastomoses. A, end to end; B, side to side; C, end to side; D, end to end by Murphy button.

(From Colp and Keller's *Text-book of Surgical Nursing*)

tuberculous ulcers, or they may be torn by some traumatic condition resulting from a stab or bullet wound. The symptoms are those of peritonitis. The operation at first is in the nature of an exploratory laparotomy. A search is made for the injured intestine and when found the wound, if small, is closed by a purse-string suture. If the wounds are multiple, it may be necessary that that part of the intestine be resected, and the two open ends of the gut which have resulted may then be joined together by what is known as an end-to-end, end-to-side, or side-to-side anastomosis (Figs. A, B, & C). Resection is also employed in conditions of intestinal growths, either benign or malignant.

INTRAVENOUS ADMINISTRATION OF MEDICINES

If the condition of the patient is too poor to warrant the time necessary to anastomose the intestines with suture, a Murphy button may be employed (Fig. D). This is a perforated metal button consisting of two halves. One half is introduced into one open end of the intestine and the intestine drawn over it by suture. The other half is inserted into the other open end of the gut. The two parts of the button are then locked together, thus anastomosing the walls of the intestine. The button eventually passes along the intestine after the union between the bowel segments has become firm.

Post-operative Treatment.—Operations upon the intestines require the same care practically as that following operations upon the stomach, except that cathartics by mouth should not be given too early, and, when one is given, a mild cathartic rather than a severe purgative should be prescribed. While the patient should be kept free from pain, too much morphine should not be administered, for there is always danger of intestinal paresis due to over dosage of this powerful hypnotic. Should the patient become distended, an irritative enema should be administered, and after the fourth day, colon irrigations may be employed without any danger. If a Murphy button has been used for anastomosis, all stools should be examined for the presence of the button, and its passage should be immediately reported.

INTRAMUSCULAR ADMINISTRATION OF MEDICINES

The site for an intramuscular injection is usually one of the buttocks, or the front of one of the thighs. The skin over the site of injection is sterilized in the usual manner. A sterilized hypodermic syringe is filled with a well diluted solution of the drug to be injected and fitted with a large firm needle. The needle is then inserted perpendicularly into the muscles. The syringe may now be withdrawn or slightly aspirated. If blood is obtained a new site must be chosen as the needle has probably been stuck into a vein. If no blood is obtained the solution may be injected, but very slowly; and the area of injection should then be thoroughly massaged and covered with a little collodion or some other dressing.

INTRAVENOUS ADMINISTRATION OF MEDICINES

Intravenous Injection.—The median basilic or median cephalic vein of the front of the elbow is the most suitable vein for injecting drugs. A rubber or gauze bandage is tightly wound around the middle of the arm and the hand is gripped firmly while the forearm is extended. The vein is thus made to stand out prominently. The surface of the

INTRAVENOUS INFUSION

skin over the vein is then sterilized with green soap, 50 per cent. alcohol and a 1:2000 bichloride of mercury, or the site may be painted with tincture of iodine.

A sterilized hypodermic syringe is now filled with a sterile solution of the drug to be injected, and the air expelled from the syringe. The needle is then inserted into the vein pointing it toward the heart and a few drops of blood slightly withdrawn from the vein. When blood enters the syringe you are sure the needle is in the vein.

The bandage of the arm may now be loosened and the solution of the drug should be injected very slowly. Slow injection is very important, as serious, even fatal results have occurred from too rapid injection.

INTRAVENOUS INFUSION

An intravenous infusion or injection consists in the introduction of a solution into a vein.

Conditions in which an Infusion is most Commonly Given.—1. In hemorrhage to restore immediately the volume of blood to normal, and to maintain the normal blood-pressure.

2. In shock and collapse to stimulate the circulation.

3. In postoperative conditions or in diseases such as cholera to restore the volume of blood and supply fluid to the tissues depleted by vomiting, purging and perspiration, etc.

4. In toxemia to dilute the poisons, to flush the kidneys and carry away the poisons.

In severe shock or collapse sometimes small amounts of a solution containing adrenalin are given. Adrenalin contracts the blood vessels and raises the blood-pressure.

The effects of an intravenous infusion will depend upon whether the volume of blood has previously been decreased or not.

1. When the volume has been reduced by a severe hemorrhage, by persistent vomiting or excessive purging, etc., the effect is to increase the volume of blood, raise the blood pressure, and stimulate the heart and circulation.

2. When the volume of blood has not been decreased by hemorrhage, etc., a saline infusion has little, if any, effect on the blood-pressure.

The solutions used are: 1. *Normal salt solution.*—This contains 0.9 per cent. of sodium chloride. Even slight variations from this strength may be dangerous.

2. *Locke's Solution.*—This contains sodium chloride 0.9 gm.; potassium chloride, 0.042 gm.; calcium chloride, 0.024 gm.; sodium bicarbonate 0.03 gm.; dextrose 0.1 gm., and distilled water sufficient to make 100 c.c. This is the best solution because it contains the necessary salts and is

INTRAVENOUS INFUSION

alkaline and nutritive. It, therefore, supplants blood which may have been lost (or withdrawn because impure) and it supports the heart.

In diabetic coma, a 4 per cent. solution of bicarbonate of soda is sometimes given intravenously to neutralize the acidity or to increase the alkalinity of the blood and thus relieve the acidosis to which the coma is due.

In the very emaciated, in pneumonia, in gastric ulcer, carcinoma, and operations on the alimentary tract a 10 per cent. glucose solution is sometimes given intravenously to supply the tissues with nourishment in a form that can be quickly utilized to produce heat or energy.

There is danger of injury to the vein followed by phlebitis with thrombus formation and embolism, the introduction of bacteria causing septicemia, and of the introduction of air, and of foreign matter causing a very serious reaction endangering the life of the patient.

The **temperature** of the solution should be from 110° to 118° F., heat being a valuable stimulant.

The **amount** of solution given will depend upon the condition of the patient, the purpose for which the treatment is given, or the effect desired. In some cases 200 to 500 c.c. may be given and, again, from one to five pints may be slowly introduced, according to the necessities of the case. (Brewer.)

The Procedure.—*Preparation of the Patient.*—The veins into which the injection is given are the median cephalic or the median basilic, in front of the elbow, which is usually the largest, the most prominent and nearest to the surface. To prepare the part the following articles will be needed: a dressing rubber to put under the arm to protect the bed, sterile towels to cover the rubber and the immediate area around the elbow, a tourniquet (to apply around the upper arm to shut off the return of blood by the superficial veins making the veins at the elbow prominent), and disinfectants to sterilize the skin. When applying the unsterile tourniquet see that the loose ends are directed upward so that they will not be in the way or contaminate the area or any sterile article. A good light is also absolutely essential.

The *instruments and utensils* needed will depend upon the method used. The solution may be poured from a graduated glass into a glass funnel connected by rubber tubing, etc., to the infusion needle or it may be made to flow by gravity or siphonage directly from a glass flask through the rubber tubing, connecting tip and needle, etc., into the vein. The latter method is described under "HYPODERMOCLYSIS."

When the first method is used the articles required will be the glass graduate containing the solution and a sterile

INTUSSUSCEPTION

thermometer to test the temperature, a glass funnel, rubber tubing with a small metal connecting tip on the end to fit into the needle and having a glass connection in the rubber tubing through which air bubbles in the solution may be detected, also a clamp to shut off the flow, infusion needles, sterile cotton pledgets, a paper bag and basin for soiled pledgets or instruments, a sterile dressing and adhesive or bandage to retain it. If the arm is fat, the veins embedded or collapsed, it may be necessary to incise the skin and expose the vein. For this will be needed, in addition, a hypodermic loaded with cocaine 2 per cent., a scalpel, an aneurysm needle, artery clamps, catgut, probe, scissors, needle holder, dressing forceps, suture silk and needles.

Method of Procedure.—After the needle is inserted in the vein, the tourniquet is loosened. Air is expelled from the tubing and while fluid is running the tubing is attached to the needle. The injection must be given very slowly, the funnel being held from one to three feet above the head. Dr. Hare advises one foot above the arm and states that at least thirty minutes should be used in injecting as much as a quart. Where a flask is used (second method) the nurse must see that the solution does not drop low enough to allow air bubbles to enter the tubing, and that the temperature of the solution is maintained by adding, if necessary, hot solution. She should also watch the patient's color, pulse, and breathing, and keep a record of the amount of solution given.

The procedure is conducted under the most sterile aseptic precautions. The doctor wears gloves, and everything, except the dressing rubber and tourniquet, must be sterile.

This treatment is **contraindicated** when *edema* is present.

It is **indicated** when rapid action is desired, when the circulation is poor, and when the tissues are unable to absorb fluid. When this is not the case the same effects may ultimately be secured either by giving the injection into the tissues (hypodermoclysis), or into the rectum (proctoclysis). Effects by hypodermoclysis are secured more rapidly and directly than by proctoclysis.

INTUSSUSCEPTION

This condition is a form of intestinal obstruction brought about by the telescoping of one portion of the bowel into the other. The treatment, as a rule, is operative entailing a reduction of the intussusception, or if the bowel is gangrenous, a resection of the involved portions. There is nothing special in its nursing.

See **INTESTINAL OBSTRUCTION**.

IODIDES

INUNCTIONS

Drugs are frequently given for absorption by rubbing on the skin. They are usually applied in the form of an ointment from which the drug is absorbed and produces its effects. The ointment must be rubbed over a large area of skin to get the greatest amount of absorption, and since the pores of the skin frequently get clogged up with it after constant use, a different region of the body should be used every day. Six successive daily rubbings on various parts of the body are called a "course." The course is usually given in the following order:

Each thigh, each arm, the chest, and finally the back. On the seventh day the patient should be given a bath to eliminate the drug and then the course is begun again.

When administering potent remedies by means of rubbings, the nurse should protect her hands by old kid gloves or by rubbing the ointment with a piece of chamois. Otherwise she may absorb it herself and get poisonous effects. The efficiency of the method depends largely on the vigor with which the ointment is rubbed and the extent of surface upon which the ointment is rubbed.

IODIDES

The iodides are salts formed by the action of an alkali, such as sodium, potassium or ammonium, on hydriodic acid, an acid formed from iodine.

Appearance of the Patient

After a single dose of one of the iodide salts is given, except for its slightly metallic salty taste, a slight burning pain in the stomach, and perhaps some slight nausea for a few minutes, there are no appreciable effects.

If the iodides are given continuously for some time, however, the secretions are all increased, the pulse is somewhat faster and softer, the patient passes more urine and feels much better.

Prolonged administration of the iodides to a patient suffering from any manifestation of **syphilis**, especially any symptoms of **the third stage**, causes a gradual disappearance of these symptoms, and in a very short time the patient feels entirely well again.

Local action. The iodides produce no local effect when applied on the skin or mucous membranes, but they are rapidly absorbed into the blood from all mucous membranes.

In the mouth: The iodides have a characteristic salty metallic taste.

In the stomach: They slightly increase the secretions,

IODIDES

and occasionally cause nausea, and slight discomfort. The intestines are not usually affected by the iodides.

The iodides cure the third stage of syphilis, by causing the absorption of newly formed areas of round cells, or gummata, which cause the various symptoms. They also probably destroy the spirochetæ which cause the disease.

Action on the secretions: The iodides increase the secretions of all the mucous membranes and secretory glands.

Action on the Thyroid Gland: Iodine is a normal constituent of the thyroid gland and is necessary for the formation of its secretion. By providing this gland with more iodine its secretions are increased. As a result, it makes the pulse somewhat more rapid, and lowers the blood pressure.

Action on nutrition: They increase the nutrition of the tissues and hasten the excretion of waste products.

Effect on newly formed connective tissues: The iodides increase the absorption of newly formed connective tissue. They are used to absorb old scar tissue in any organ of the body. They are frequently used for this effect in arteriosclerosis (hardening of the arteries), cirrhosis of the liver, etc.

Newly formed connective tissue cells are small round cells which resemble the round cells found in gummata. These cells may therefore be affected by the iodides in the same way as the gummata or round cell formations of the third stage of syphilis or as a result of the increased secretion of the thyroid gland.

Accumulations of serum in the chest (pleurisy with effusion) or in other parts of the body, are more rapidly absorbed when iodides are given.

Action on the circulation: Iodides do not usually affect the pulse. They occasionally lower the blood pressure when it is high and make the pulse somewhat more rapid.

Action on the kidneys: The iodides slightly increase the flow of urine.

Excretion

The iodides are eliminated from the body by the urine, mainly as iodides, usually within twenty-four hours.

Idiosyncrasies

In some individuals small doses of the iodides often cause poisonous effects.

Poisonous Effects

The iodides do not cause acute poisoning. Since they are excreted more slowly than they are absorbed, after prolonged administration, chronic poisoning or **iodism** fre-

IODIDES

quently results from the accumulation of some of the drug in the body. These cumulative symptoms occasionally occur in some individuals from very small doses.

The symptoms of iodism are due to the excretion of the iodine by the various mucous membranes, and they are not so apt to occur in syphilitic patients.

Cumulative Symptoms or "Iodism"

The first symptom of excessive iodide action is:

Profuse secretion of mucus from the nose (coryza) and sneezing.

These are soon followed by:

2. Red, swollen eyelids with excessive flow of tears.

3. **Frontal headache.**

4. Cough, with profuse expectoration of mucus.

5. Increased flow of saliva.

6. Sore throat and difficulty in swallowing.

7. **Skin eruptions**, such as areas of redness, or small pustules on the face, back, shoulders or thigh (acne). Occasionally eczema occurs.

8. The pulse is often rapid and a slight rise in temperature may occur.

9. Nausea and diarrhea occasionally occur.

10. Weakness, loss of weight, and pains in the joints occasionally result from continued use.

Treatment.—When the iodides are stopped, the symptoms usually disappear.

Uses

The iodides are used principally:

1. **As a specific for the third stage of syphilis.** In syphilis, the treatment must be continued for about three years; even if the patient has no symptoms, to eradicate all the poison from the body.

2. They are also frequently used to absorb connective tissue in various chronic diseases characterized by the formation of connective tissue in various organs and tissues of the body. For example, in **arteriosclerosis, cirrhosis of the liver, chronic nephritis.**

3. To increase the absorption of inflammatory swellings of the glands and other tissues, and to absorb fluids in the chest.

4. To increase the secretions of the mucous membranes, such as those of the bronchi, the nose, etc.

Administration

The iodides are best given after meals, in milk, wine, aromatic spirits of ammonia, or the compound spirits of sarsaparilla, or cinnamon water, to disguise the unpleasant taste. They are occasionally given in pills or capsules.

IODINE

Preparations

Potassium Iodide; dose 5 to 15 grains. In syphilis it may be given up to 60 grains.

This is the most efficient and most commonly used preparation. It often comes in 50 per cent. or saturated (100 per cent.) solutions.

Sodium Iodide; dose 2 to 20 grains.

Ammonium Iodide; dose 2 to 15 grains.

Strontium Iodide; dose 5 to 15 grains.

Dilute Hydriodic Acid; dose 5 to 10 minims.

This contains 10 per cent. of hydriodic acid.

Syrup of Hydriodic Acid (Syrupus Acidi Hydriodici); dose $\frac{1}{2}$ to 2 drams. This contains 1 per cent. of hydriodic acid.

For Local Use

Potassium Iodide Ointment (Unguentum Potassii Iodidi).

IODINE

Iodine is a non-metallic element obtained from the ashes of sea weeds. Iodine itself is not used in medicine, but various solutions and compounds of it are frequently employed.

Antiseptic Action: Iodine checks the growth of bacteria, having a marked disinfectant action. It has been used very extensively for the last few years to disinfect the skin in preparation for operations. It is of special value for this purpose since it also contracts and hardens the skin so that bacteria cannot be carried from the skin to the deeper tissues of the wound. It should not be applied in a concentrated solution or when the skin is moist, as it is then apt to cause blisters or even to destroy the deeper tissues.

Local action: Iodine stains the skin a dark brown color and makes it red and warm. Strong solutions cause blisters and may even destroy the skin. It is also slightly absorbed from the skin.

On mucous membranes: It produces redness, smarting and increases the secretions.

Internal Action: When taken internally, it causes nausea and occasionally vomiting and diarrhea. It is readily absorbed from the stomach in a few minutes.

Excretion: Iodine is eliminated from the body in a few minutes; by all the secretions as well as by the kidneys.

Poisonous Effects

Acute poisoning from iodine occurs very rarely; usually from the injection of iodine into cysts in order to obliterate

IODOFORM

them, and occasionally from iodine taken with suicidal intent.

Symptoms: 1. Nausea and continuous vomiting. The vomited matter contains iodine which turns blue if starch is also present.

2. Diarrhea.

3. Cyanosis.

4. Collapse, rapid thready pulse, cold moist skin, slow shallow breathing and dilated pupils. Death usually occurs in a few days.

Treatment: Give boiled starch as an antidote. Protect the mucous membrane with albumin water, milk or other protecting drinks; treat the collapse with heart stimulants; such as caffeine, atropine, strychnine, etc.

Chronic Poisoning 'Iodism': Continued use of iodine often causes the following symptoms:

1. Skin eruptions, beginning at the site of application; consisting of areas of redness.

2. Increased secretion of mucus from the nose and bronchi.

3. Rapid pulse.

4. Nervousness and tremors of the fingers.

The symptoms usually disappear when the iodine applications are stopped.

Preparations

Tincture of Iodine; dose 3 to 8 minims.

This contains 7 per cent. of iodine and 5 per cent. of potassium iodide in alcohol.

Compound Iodine Solution (Lugol's Solution); dose 3 to 12 minims.

This contains 5 per cent. of iodine dissolved in 10 per cent. of potassium iodide solution.

Iodine Ointment

This contains 4 per cent. of iodine.

Sulphur Iodide

This is a mixture of iodine and sulphur.

IODISM

See IODIDES, IODINE.

IODOFORM

Iodoform is a yellow crystalline powder which has a very characteristic odor and a sweet taste. It contains about 97 per cent. of iodine.

Local action: Applied to the skin, to wounds or mucous membranes, iodoform acts as a mild antiseptic and disinfectant. It absorbs the fluids from the wound and in this way it prevents the growth of bacteria. Iodoform is very soothing to the skin or mucous membranes.

IPECAC

Poisonous Effects

Iodoform is often absorbed into the blood from wounds or sinuses, especially when the surface of the wound is very extensive. This is more apt to occur in adults or susceptible individuals. It produces the following characteristic poisonous symptoms.

1. In mild cases there may be only a rise of temperature; 104° to 105° F. Headache, dizziness, very rapid pulse and loss of appetite, also occasionally occur.

In severe cases the following symptoms may also occur:

2. The patient feels depressed, downhearted, even melancholy.

3. Hallucinations (ideas of being persecuted and attempts at suicide).

4. Delirium, even mania.

5. Collapse, which may cause death.

The symptoms may last for several hours or days. Occasionally there is no excitement, the patient goes into stupor and dies of collapse.

The **dose** of iodoform is $\frac{1}{2}$ to 3 grains.

Iodoform is used principally externally in wounds and sinuses in the form of Iodoform gauze.

Iodoform gauze is made by soaking sterile gauze in a solution containing 5 to 10 per cent. of Iodoform, 20 to 15 per cent of glycerin and adding alcohol up to 100 c.c.

Iodoform Ointment contains 10 per cent. of iodoform.

IPECAC

Ipecac is a drug obtained from the roots of the **Cephaelis ipecacuanha**, a wild plant growing in Brazil, Colombia and other parts of South America.

Its active principles are the **alkaloids**: **Emetine** and **Cephaeline**.

The vomiting is due principally to the cephaeline and partly to the emetine.

Appearance of the Patient

If a patient is given a moderately large dose of one of the preparations of ipecac, a very short time after the administration he feels nauseated and vomits profusely. The vomiting is usually accompanied by profuse secretion of saliva, of tears, and of mucus from the bronchi. Occasionally, if the entire amount of drug is not completely excreted in the vomited matter, it may cause profuse diarrhea and symptoms of mild collapse: rapid pulse, slower respiration, and cold moist skin.

Local Action: On the skin ipecac produces redness, itching and small pustules.

IPECAC

On the mucous membranes: On the eye it causes slight redness and swelling with a profuse flow of tears. In the nose it causes profuse secretion and continual sneezing.

Internal Action: In the mouth: It increases the flow of saliva.

In the stomach: Ipecac acts principally on the lining membrane of the stomach, causing redness and swelling with an excessive secretion. This causes the muscle wall of the stomach to contract violently, thereby producing vomiting. The vomiting continues, until all the ipecac in the stomach is entirely expelled.

In the intestines: The action on the intestinal tract is similar to that in the stomach; the lining membrane becomes red, swollen and secretes an excessive amount of mucus, thereby producing contractions of the muscle wall of the intestines which result in profuse diarrhea. The stools often contain blood, from the excessive irritation.

Action after Absorption.—Some of the ipecac is rapidly absorbed from the stomach. It then acts principally on all the mucous membranes. On the mucous membrane of the bronchi, it causes a profuse secretion of mucus. (It is commonly given in cough mixtures for this effect, especially to children, to increase expectoration.)

The symptoms of collapse, which occasionally result after large doses of ipecac, are usually due to the great strain of continual vomiting.

Specific Action

Ipecac is now used as a specific for Amebic Dysentery and in *Pyorrhœa alveolaris*. The effect is due to the **emetine**, which destroys the ameba.

For its specific action ipecac should be given in keratin coated pills so as to avoid its action on the stomach and thereby to prevent vomiting.

Excretion

Ipecac is usually excreted by the stomach in the vomited matter, and does not therefore produce any poisonous symptoms.

Preparations

Powdered Ipecac, as emetic; dose 30 grains; as expectorant; dose 1 to 5 grains.

Powdered Ipecac and Opium (Dover's powder); dose 5 to 15 grains. (Contains 10 per cent. opium and 10 per cent. ipecac.)

Fluidextract of Ipecac, as emetic; dose 15 to 30 minims; as expectorant; dose 3 to 8 minims.

IRON

The following two preparations are given mostly to children.

Syrup of Ipecac, for infant as emetic; dose 30 to 60 minims; (7 per cent. of fluidextract) as expectorant; dose 2 to 15 minims.

Wine of Ipecac; for a child as emetic; dose 30 to 60 minims; (10 per cent. of fluidextract) as expectorant; dose 2 to 15 minims.

Emetine Hydrochloride; dose $\frac{1}{3}$ to 1 grain.

This has recently been used with brilliant results in the treatment of amebic dysentery. It is given hypodermically in small doses and by mouth in the maximum dose.

Administration

If given to produce vomiting, it is best to dilute ipecac preparations in warm water.

If given as an expectorant, especially to croupy children, the preparations should be given in syrup.

IRON (FERRUM)

Iron is a heavy metal; many of its preparations are used as drugs. Many food substances, such as meat, eggs and some vegetables, contain a great deal of iron. In the body, iron is found principally in the hemoglobin of the blood.

Local Action: On the skin, iron causes no effect, but if it is applied to a bleeding surface, it stops the bleeding, by precipitating the albumins of the blood, which then close up the bleeding vessel. **Mucous membranes** are contracted by preparations of iron (astringent action).

Internal Action

In the mouth: Iron has a distinct metallic taste, and shrinks the lining membrane of the mouth, making it feel dry. It also discolors the teeth, if used continually.

In the stomach: It contracts the lining membrane and occasionally causes nausea.

In the intestine: It contracts the lining membrane, checking the secretions, thereby producing constipation.

Action after Absorption

If iron is taken for any length of time the red blood corpuscles of the blood contain more hemoglobin. The contractions of the heart are improved; the patient is able to breathe deeper, and thus inhales more air; the food is digested better; the muscles contract better; the brain acts better, the patient is brighter, is more in harmony with his surroundings, and all the organs of excretion, such as the kidneys, the lungs and skin, eliminate waste products better and quicker.

Appearance of the Patient

As a result of the improved activity of all the organs of the body, the patient feels brighter, is more active, and more robust. He looks better, has a ruddier color, his appetite is better, and he digests his food better.

The effects do not appear after a few doses, but result from continued administration of iron.

Excretion

Only part of the iron taken as a medicine, or in the food, is absorbed. The rest is excreted by the intestines, in the stools. On account of the large amount of iron present in the stools, the lining membrane of the intestines is contracted, and constipation results.

Uses

Iron is used principally in cases of **anemia**, a condition in which the patient's blood is very poor. For example—when the patient has lost a great deal of blood, or when he is suffering from some chronic disease, such as tuberculosis or cancer. It is used with best results in a peculiar kind of anemia, occurring in young girls, called **chlorosis**.

Poisonous Effects

In some cases, after continued use of iron for any length of time, it produces the following symptoms: frontal headache, loss of appetite, pain in the pit of the stomach, occasionally nausea and vomiting, colic and invariably constipation. Sometimes the skin becomes covered with very small pustules (acne).

The condition is relieved by stopping the iron, and giving cathartics.

Administration

In giving iron, the nurse should remember the following rules:

1. Iron should always be given after meals, well diluted, in an albuminous fluid such as milk.
2. To avoid discoloring the teeth, iron should always be given through a glass tube or a straw, so that the drug does not touch the teeth.
3. To avoid constipation, the bowels should be moved regularly with some cathartic, or a preparation of iron should be given which contains a cathartic.
4. If a gargle containing iron is given, the teeth should be brushed and the mouth then rinsed with salt water after each administration.
5. Silver spoons are stained by iron; they should never be used in giving any of the preparations. Strong ammonia water removes these stains.

IRON

6. Iron stains clothing, sheets, carpets, etc. Oxalic acid removes these stains.

Preparations

There are a great many preparations of iron, but only the most important ones follow:

There are several preparations of iron which are only used for their local effects or to check bleeding.

For internal use there are two kinds of preparations: inorganic and organic.

The **inorganic** preparations are metallic salts of iron.

The **organic** preparations are preparations of iron combined with various kinds of proteins, such as egg albumin.

The organic preparations do not contract mucous membranes as much as the inorganic ones; and are, therefore, not so apt to cause unpleasant symptoms after continued use.

Preparations for Local Use

Solution of Iron Subsulphate (Monsell's solution); dose 3 to 10 minims.

This preparation contains about 13 per cent. of iron.

Iron Chloride

This preparation is used in a 20 per cent. solution.

These two preparations are principally used to stop bleeding or to contract mucous membranes, either by local application, or in the mouth as a gargle.

, **Iron Sulphate** (Green vitriol); dose $\frac{1}{2}$ to 5 grains.

This is seldom used internally, but it is used to contract mucous membranes and check bleeding. It is also used as a disinfectant for privies or drains.

Preparations for Internal Use

Pills of Iron Carbonate (Blaud's pills); dose 1 to 5 pills.

These pills consist of iron sulphate, the carbonate of sodium or potassium, tragacanth, sugar and glycerin.

Each pill contains about 1 grain of iron.

These pills should always be fresh. Old pills may pass through the intestines without causing any effects, or without being changed in any way.

Reduced Iron (Ferrum Reductum); dose 1 to 2 grains.

This is a brown powder which is tasteless and does not contract mucous membranes. It is often given to children in candy.

Soluble Iron Phosphate; dose 1 to 5 grains.

Iron Citrate; dose 1 to 5 grains.

Solution of Iron Tersulphate

This contains 10 per cent. of iron.

IRON

It is only used in making up other preparations, especially the antidote for arsenic.

Tincture of Iron Chloride; dose 5 to 30 minims.

This is one of the best preparations of iron, and is very frequently used. It contains about 4 per cent. of iron in alcohol.

It is best given in milk or in glycerin, 3 parts of the preparation to one of glycerin, (to prevent constipation) or in egg albumin, to prevent its blackening the teeth.

Solution of Iron and Ammonium Acetate (Liquor Ferri et Ammonii Acetatis) (Basham's mixture); dose 4 to 8 drams.

This preparation contains very little iron and must be freshly made. It consists of tincture of iron chloride, dilute acetic acid, solution of ammonium acetate, elixir of orange, glycerin and water.

Syrup of Iodide of Iron; dose 5 to 30 minims, well diluted.

This is an excellent preparation especially for children. It contains about 2 per cent. of iron.

Compound Iron Mixture (Mistura Ferri Composita) (Griffith's mixture); dose 4 to 8 drams.

This preparation contains iron sulphate, potassium carbonate, myrrh, sugar and spirits of lavender.

Elixir of Iron, Quinine and Strychnine Phosphate

This preparation is very frequently used as a tonic. It contains about 2 per cent. of iron phosphate.

Each teaspoonful dose contains $\frac{1}{2}$ grain of iron phosphate and quinine and $\frac{1}{64}$ grain of strychnine.

Syrup of Iron, Quinine and Strychnine Phosphate; dose 1 to 2 drams.

This preparation contains 9 per cent. of iron phosphate. Each teaspoonful dose contains 5 grains of iron phosphate, $\frac{1}{80}$ grain strychnine and $1\frac{1}{2}$ grains of quinine.

Antidotes for Arsenic

Iron Hydroxide

This preparation is used principally as an antidote for arsenic poisoning. About 8 grains of it will neutralize 1 grain of arsenic. It must always be fresh.

If iron hydroxide is not on hand, it can be made from the tincture of iron chloride, by adding ammonia water or sodium carbonate to it. A precipitate (sediment) will then form. Enough ammonia or sodium carbonate must be added until no more sediment forms. The sediment is then washed and strained, and given in milk; as often as is necessary to neutralize the arsenic.

Iron Hydroxide with Magnesium Oxide; dose 4 to 8 drams.

IRRIGATION

This is made from iron sulphate, to which magnesia is added. It is the best antidote for arsenic poisoning.

Dialyzed Iron; dose 20 to 40 minims.

This is a preparation of iron which is frequently used as an antidote for arsenic poisoning. It is also used in the treatment of anemia.

Incompatibilities of Iron

The following drugs cannot be given together with iron because they form chemical compounds with it:

Preparations of iron should never be given with tea, or with vegetable drugs containing tannin or tannic acid, as iron combines with these drugs and forms ink.

The alkaline preparations of iron should not be given with acids. For example—do not give Basham's mixture together with dilute acids, as they combine and form a sediment.

The iron salts of the mineral acids should not be given with alkalies. For example—do not give tincture of iron chloride with sodium bicarbonate, as they will combine and form a sediment.

IRRIGATION

See BLADDER IRRIGATION; COLON IRRIGATION; and RECTUM, ADMINISTRATION OF MEDICINES BY.

ISCHIO-RECTAL ABSCESS

An abscess about the rectum is like an abscess in any other part of the body except that it may communicate with the rectum, and if not treated properly a fistula may result. This is a tract connecting the skin and rectum. For this reason it is always better to incise and drain the abscess as soon as possible, packing the abscess cavity and permitting it to granulate from the bottom.

Fistula in Ano.—This may be the result of a poorly treated ischio-rectal abscess. It is important in treating the fistula that the tract be incised in its entirety by careful and complete dissection.

Ante-operative Treatment.—A cathartic is given twenty-four hours before operation, usually an ounce of castor oil. Four hours before operation, the lower bowels should be thoroughly washed with a warm soap-suds enema. At least three of these should be given. If the third return is not clear, more enemata should be administered until the rectum is absolutely cleansed. This rectal treatment should not be administered just prior to operation, because much of the liquid material is apt to be retained and the surgeon is hampered in his work by the escape of rectal fluid. Some

ITCH MITE

surgeons inject the fistulous tract with a solution of methylene blue, a dye which colors the tract making its ramifications evident. This may be done before or after the anesthesia has been begun.

Operation.—Until the patient regains consciousness, the legs should be tied together. In operations about the rectum, retention of urine is apt to result and great care should be taken lest the bladder become distended. The diet should be constipating and to further constipate the patient a pill containing opium is given three times a day. The bowels should be moved upon the fourth day, and, after the movement, the parts washed with soap and warm water, and fresh packing introduced. The packing must be changed each time the bowels move, if stained with fecal material. The dressing of these cases is exceedingly important. If the packing of the cavity is left to the nurse, she should very conscientiously see that it is firmly and securely introduced into the depths of the granulating cavity. The proper healing will do much to prevent a recurrence of the fistula.

ISOPRAL

Isopral is a white crystalline substance, with an aromatic taste and an odor resembling camphor. It produces sleep in about five minutes after it is given. Its effects are similar to those of chloral, but it is not as poisonous. Dose, 3 to 8 grains.

ITCH

See LICE.

ITCH MITE

See LICE.

J

JABORANDI

See PILOCARPUS.

JALAP

Jalap is the root of the *Ipomœa jalapa*; its active principle is a resinous substance, **jalapin**. It is one of the most commonly used drastic cathartics.

Preparations

Resin of Jalap; dose 2 to 5 grains.

Compound Jalap Powder; dose 15 to 60 grains.

This contains jalap and cream of tartar.

JAMESTOWN WEED

See STRAMONIUM.

JAVELLE SOLUTION

See CHLORINE.

JAWS

Treatment of New Growths of the Jaws.—If the cysts are small, they are removed and the membrane which lines the cavity is destroyed. If necessary, the cavity is packed and the wound permitted to heal by granulation tissue. The only treatment is to keep the mouth clean.

In the case of benign tumors, the tooth about which the tumor grows is removed and with it a portion of the bone. The removal is accomplished by a Gigli saw. It is always convenient to have at hand an actual cautery or Horsley's wax to control the hemorrhage which may ensue from the bone.

The cases of malignant growths, either carcinoma or sarcoma, demand radical operation. In the case of the upper jaw, this is not so practical because, with the removal of the bone, the eyeball loses its support and drops from its normal anatomical position resulting in a condition of double vision or diplopia; and, by removing the hard palate, a com-

JOINTS

munication is made between the nose and mouth. However, in spite of these two obstacles, the operation is occasionally done.

The removal of the lower jaw, however, is not so difficult; it may be removed either partially or in its entirety. The actual operative technic is more of interest to the surgeon than the nurse and will not be discussed here. The nursing procedures are the same as for any radical operation on either the upper or lower jaw.

Ante-operative Treatment.—The mouth should be cleansed very carefully. The operative field, in the male, should be prepared by shaving an hour before the operation, as the beard sometimes grows very rapidly and nothing is more disagreeable than to have the patient enter the operating room not properly prepared.

Post-operative Treatment.—The packing, which is introduced at operation into the area vacated by the maxilla, is removed, as a rule, after twenty-four hours. The space left by the removal of the upper jaw should be sprayed through the mouth every two to three hours with some antiseptic solution. The patient, as soon as he is able, should wash his mouth himself every two or three hours. For the first three days, it is better not to give food by mouth; the nourishment is supplied either by nutriment enemata, or by nasal gavage, the catheter being passed through the nostril on the sound side. As soon as the wound granulates, the patient may be given a liquid diet, the food always being introduced along the sound side of the mouth. Great care should be taken that the mouth be thoroughly cleansed after each feeding. Some surgeons request that the cavities be lightly packed with gauze during feedings so as to prevent the liquid food from entering the operative wound. This is not so important a procedure with liquids as it is with soft diet, which is allowed after about three weeks. It is unnecessary to confine the patient to bed any longer than four days, provided that everything goes smoothly, for needless confinement to bed often causes weakness.

JOINTS, CLASSIFICATION OF

Joints or Articulations are connections existing between bones.

**Immovable
Joint
or
Synarthrosis**

- 1. *Sutures.*—Articulations by processes and indentations interlocked together. A thin layer of fibrous tissue is interposed between the bones.
- 2. *Synchondrosis.*—Temporary joint. Cartilage between bones ossifies in adult life.

JUNIPER

Slightly
Movable
Joint
or
Amphiarthrosis

1. *Symphysis*.—The bones are united by a plate or disc of fibro-cartilage of considerable thickness.
2. *Syndesmosis*.—The bony surfaces are united by an interosseous ligament, as in the lower tibio-fibular articulation.

Movable
Joint
or
Diarthrosis

1. *Arthrodia*.—Gliding joint; articulates by plane surfaces which glide upon each other.
2. *Ginglymus*.—Hinge or angular joint; moves backward and forward in one plane.
3. *Enarthrosis*.—Ball-and-socket joint; articulates by a globular head in a cup-like cavity.
4. *Trochoides*.—Pivot joint; articulates by a pivot process turning within a ring, or by a ring turning around a pivot.
5. *Condylarthrosis*.—Condylloid joint; ovoid head received into elliptical cavity.
6. *Reciprocal Reception*.—Saddle joint; articular surfaces are concavo-convex.

JUNIPER

Juniper is obtained from the unripe, full-sized berries of the **Juniper communis**, or juniper plant. Its active principle is a volatile oil, the oil of juniper, which is obtained by distilling the berries.

Local action: Juniper produces slight redness of the skin and mucous membranes if applied locally.

Internal Action.—Taken internally: It increases the secretion of the stomach and intestines. It thereby increases the appetite and aids digestion. Its principal effect, however, is to increase the flow of urine.

Poisonous Effects

Overdoses of juniper usually cause painful urination with bloody urine.

Administration

Juniper is rarely given alone. It is usually combined with cream of tartar or other alkaline diuretics.

JUNIPER

Preparations

Oil of Juniper; dose 5 to 15 minims.

Spirits of Juniper; dose 30 to 60 minims.

The most commonly used preparation, however, is the infusion of juniper berries. It is made by boiling an ounce of the berries in a pint of water, and is given in doses of 30 to 60 minims.

K

KAMALA

Kamala is a reddish brown powder consisting of the minute glands and hairs from the capsules of **Mallotus philippensis**, an East Indian shrub. Its active principles are two resinoid substances, **kamalin** and **rottlerin**.

Kamala destroys the tape worms and causes profuse diarrhea so that no cathartic is necessary after its use.

About 1 to 2 drams of the powder is given in syrup, and repeated in two hours if the bowels do not move. **A tincture of kamala** is also occasionally given.

See ANTHELMINTICS.

KELENE

See ANESTHETICS (ETHYL CHLORIDE).

KIDNEYS

The kidneys are two compound tubular glands, placed at the back of the abdominal cavity, one on each side of the spinal column and behind the peritoneal cavity. They correspond in position to the space included between the upper border of the twelfth thoracic and the third lumbar vertebra. The right is a little lower than the left in consequence of the large space occupied by the liver.

Capsule and supports.—The kidneys are covered by a thin but rather tough envelope of fibrous tissue called the capsule. The kidneys are usually embedded in a mass of fatty tissue termed the perirenal fat, and are not held in place by any distinct ligaments, but rather by the pressure and counter-pressure exerted upon them by neighboring structures.

Size and shape.—Each kidney is about four and one-half inches long, two and one-half inches broad, one and one-half inches thick, and weighs about four and one-half ounces. They are bean shaped, with the concave side turned toward the spine, and the convex side directed outward. Near the center of the concave side is a depression called the hilum,

KIDNEYS, SURGICAL CONDITIONS OF

which serves as a passageway for the ureter, and for the blood-vessels, lymph-vessels, and nerves going to and from the kidney.

KIDNEYS, DISEASES OF

See NEPHRITIS.

KIDNEYS, SURGICAL CONDITIONS OF

Treatment of Acute Infections of the Kidneys.—In *pyelitis*, the treatment is primarily medical. The patient is placed in bed; fluids are forced to about 2000 c.c. a day, and urotropin 10 grains, or more is given by mouth three times a day. If it is thought that the *pyelitis* is in some way due to a chronic constipation with a dilated caput coli, colon irrigations are especially indicated. Occasionally the pelvis of the kidney is irrigated directly through a ureteral catheter which has been introduced into the ureter by means of a *cystoscope*. This is an instrument designed to give a view of the interior of the bladder. It has the general shape of a sound, has a telescopic lens and carries an electric light to illuminate the interior of the bladder which has been previously distended with warm boric acid. It has several modifications and attachments so that small catheters may be passed into the ureteral orifices. By this means the urine from both kidneys may be collected separately, and the condition and functional activity of each kidney may be judged.

In *pyonephrosis*, the kidney is incised in the region of the pelvis and the pus removed. This operation is spoken of as a *nephrotomy*. But if the kidney shows many areas of infection, the so-called acute surgical kidney, it may be completely removed (*nephrectomy*).

Post-operative Treatment of Nephrotomy.—Inasmuch as urine as well as pus will escape from the kidney through the wound, the dressings should be frequently removed and changed to prevent maceration of the skin. The patient is placed upon forced fluids, their amount carefully measured, and the urinary output approximately estimated. These cases are rather protracted, lasting from six to eight weeks. The nutrition should be particularly watched and every effort taken to maintain or increase the patient's weight by a liberal diet, high in carbohydrates. When the patient is allowed up, there is often a leakage of urine through the wound, and to prevent the embarrassment of a constant urinous odor, a lumbar urinal may be worn.

Nephrectomy.—When it is evident that the kidney has been destroyed to such a degree that it is of little use to the organism, it is much better to remove it completely. A

KIDNEYS, SURGICAL CONDITIONS OF

nephrectomy is always done for the acute septic kidney, diffuse pyonephrosis, tuberculosis, or new growths, provided the physical condition of the patient will permit such an operation, and the other kidney is present and not markedly diseased. If the ureter is definitely pathological, it is dissected down until a healthy portion is found, or if the entire length is affected, it might be totally excised together with the kidney.

Post-operative Treatment.—The treatment is similar to that of a nephrotomy. The drainage tubes are removed at the end of three or four days, and the patient is kept in bed for three to four weeks, until the wound has firmly and completely healed.

Renal Calculus.—Renal calculi or kidney stones may be found in the substance of the kidney, in the pelvis, or in the ureter. The stones may be single or multiple, rough or smooth, and may be present in one or both kidneys. The symptoms which they cause are those of renal colic. This is a severe colicky pain in the loin radiating downward to the testicle or vulva. Blood is found in the urine (hematuria) and there is occasionally frequency and urgency with burning micturition.

Treatment of Renal Calculus.—Patients who have a tendency to renal colic, as evidenced by a previous history of attacks, or the passage of small calculi, and whose urine contains an excess of urates, should be placed upon a diet which is poor in protein. Alcohol is absolutely prohibited, also tea and coffee. Alkaline drinks should be administered, and the alkaline diuretics, such as acetate, bi-carbonate, and citrate of potassium should be given freely and often.

Operative Treatment.—When there is definite evidence of a stone from the clinical history augmented by positive radiographic and cystoscopic findings, operation is indicated, for it is the only measure which will insure permanent relief. The operations performed for kidney stones are two in number: nephrolithotomy and nephrectomy.

Nephrolithotomy.—In this operation the procedure is similar to a nephrotomy. The usual lumbar incision is made with the patient in the kidney position, the kidney exposed, and the pedicle, that is the renal artery and the renal vein, are grasped by the hand of an assistant while the surgeon incises the kidney along the convex border. Under these hemostatic conditions the bleeding is very little. The calices of the pelvis and kidney tissue are carefully examined and the stone removed. The kidney is sutured together with mattress sutures of chromic catgut on a blunt, non-cutting needle.

KORSAKOW'S PSYCHOSIS

Post-operative Treatment.—The routine procedure in all surgical kidney cases demands that fluids be forced to the maximum. All the urine excreted should be accurately measured and saved for the inspection of the attending surgeon. The elimination must be especially watched, because after this operation, urinary suppression is apt to result. For a day or so the urine is apt to be bloody; this is not particularly alarming. During this period patients often complain of symptoms simulating renal colic, due to clotted blood passing down through the ureter. The pain is easily controlled by small doses of morphine by hypodermic injections.

KINO

Kino is the dried juice of the *Pterocarpus marsupium*, an East Indian tree. It is a strong astringent, contracting tissues and checking the secretions of the mucous membranes, because of the tannic acid which it contains.

Preparation

Tincture of Kino; dose $\frac{1}{2}$ to 2 drams.

KNOCK-OUT-DROPS

See CHLORAL HYDRATE.

KOCH'S POSTULATES

According to Koch an organism can be considered the causal agent of a given disease only after it has fulfilled certain requirements: (1) it must always be associated with the disease; (2) be isolated in pure culture; (3) produce the disease when inoculated into a healthy animal, and (4) be obtained again in pure culture. For a long time these conditions were accepted as the only proof of such a causal relationship. Recent studies in immunology and the demonstration of specific serum reactions have, however, rendered such a procedure for the most part unnecessary.

KOLA

See CAFFEINE.

KORSAKOW'S PSYCHOSIS

This is a form of alcoholic psychosis and is usually accompanied by characteristic physical symptoms due to the presence of a polyneuritis.

Physical symptoms.—At first there may be neuralgic pains and tingling sensations in the hands and feet, and then muscular weakness and tenderness over the muscles and deep nerve trunks of the limbs. Later, there may be both ankle and wrist drop due to the paralysis of the extensor muscles.

KOUSSO

Mental symptoms.—Perception is disordered during the acute stage for the patient misidentifies persons, is disoriented as to time and place and may have hallucinations. There is a marked defect of retention, and the events of the preceding moments are not remembered. To fill in and cover up the lapses in memory the patient will fabricate in a most extraordinary manner. The emotions are disturbed, and the patient may be very suggestible, responding quickly to whatever is said or proposed.

Nursing procedures.—During the acute stage the patient must be cared for in bed. Pillows and pads should be arranged so as to give greatest comfort. The feet and hands should be supported by small pillows if necessary. Pressure over the areas of hyperesthesia should be avoided and the bedclothes supported by means of cradles. As the acute symptoms subside, massage, muscle training and electric treatments are prescribed by the physician. Improvement takes place very slowly and care must be taken to avoid fatigue. To improve the memory defect, simple rhymes and easy exercises in memorizing numbers are given in the beginning, but as these are mastered the exercises may be made more exacting in their demand on attention and memory. Convalescence may be months in duration.

Occupations.—Very little can be attempted in the beginning, but when the acute stage is over passive motion of the fingers and toes may be given, and the patient interested in training his own muscles, especially those of the hands. As fast as control is regained, simple tasks like pushing marbles and blocks about, grasping and moving crayons to color outlined pictures may be given. Other forms of light handicraft may be given as fast as improvement takes place. The exercise must be passive until such time as the physician permits the patient to use his limbs. Walking for a short distance or for a short period with support on both sides may be attempted, care being taken to avoid fatigue. These periods may be lengthened as the condition improves and simple forms of gymnastics may be tried.

KOUSSO

See Cusso.

KRAMERIA (RHATANY)

Krameria is obtained from the roots of **Krameria triandra**, and of **Krameria ixima**, Para rhatany, and Peruvian rhatany, two South American shrubs.

They are powerful astringents, contracting the tissues and checking the secretions, because of the tannic acid which they contain.

KUMYSS

Preparations

Extract of *Krameria*; dose 5 to 15 grains.

Fluidextract of *Krameria*; dose 10 to 60 minims.

Tincture of *Krameria*; dose $\frac{1}{2}$ to 2 drams.

Syrup of *Krameria*; dose $\frac{1}{2}$ to $2\frac{1}{2}$ drams.

KRESAMINE

See CRESOLS.

KUMYSS

Kumyss or koumiss, is a fermented liquid prepared from mare's milk by the Tartars, who originated it. It is made from cow's milk in this country by fermenting milk with yeast. Liquid yeast is added to the milk, and the resulting fluid is then allowed to stand for about eight to ten hours in a lukewarm place.

L

LABARRAQUE'S SOLUTION

See CHLORINE.

LABOR, MANAGEMENT OF NORMAL

Surgical Cleanliness.—The great principle that should overrule and guide every move at a case of labor is that of strict surgical cleanliness. Asepsis should be aimed at in everything, and so far as instruments are concerned should be secured. In everything the strictest antisepsis should be carried out. These are the principles on which labors are conducted in hospitals, and in them puerperal sepsis is almost unknown. But it is a melancholy fact that in private practice the deaths from puerperal sepsis far outnumber those from all the other complications of childbirth put together. Moreover, apart from actual mortality, sepsis is the greatest risk a woman has to run in childbirth from the point of view of her subsequent health and well-being. The next all-important point to bear in mind is that in all cases the infection is conveyed to the patient from without; and in nine cases out of ten is to be traced to some breach in the asepsis or antisepsis of the physician or nurse.

Antiseptic Methods.—There are three main lines by which we may endeavor to reduce the risks of interference, namely: (1) strict personal asepsis; (2) careful cleansing of the external genitals of the patient; (3) infrequency of vaginal examinations.

Strict Personal Asepsis.—This applies alike to nurse and physician. It includes a great deal more than the mere washing of hands. The physician in general practice cannot avoid coming into contact with infectious cases, or cases of septic wounds, ulcers, etc. Recent contact with such a case necessitates a complete bath and change of clothes before attendance on a labor. A further defence for the patient is the wearing of a sterile overall or gown.

The cleansing of the hands before a vaginal examination should be as carefully and scrupulously carried out as for a major operation:

LABOR, NORMAL

(1) 5 to 10 minutes scrubbing with hot water, soap, and lysol, and a nail-brush that has been boiled or soaked for some time in antiseptics. Particular attention must be paid to the nails and nail-folds.

(2) Thereafter three minutes soaking in an antiseptic solution, such as biniodide of mercury in spirit 1:1000, or a similar strength of corrosive sublimate aqueous solution.

Where the hands have recently been in contact with septic matter the best plan is to wash them as in (1), then soak them in a saturated solution of potassium permanganate till they are mahogany colored. Wash this off in a warm solution of oxalic acid, and then soak them as in (2).

The routine use of rubber gloves that have been boiled and kept sterile adds much to the safety of the patient. If, however, gloves render one less careful in the cleansing of the hands, they are worse than none. For a glove may very easily be torn, or burst, and then the perfunctorily cleansed fingers come into contact with the genital tract.

Cleansing the Vulva.—Wherever possible the patient should have a complete bath at the very commencement of labor. The nurse should then pay special attention to the genitals. The hair, if very abundant or long, should be cut or shaved. Before an examination is made the vulva must be well washed with soap and water and lysol. The labia minora must be separated and wiped with pledgets of wool soaked in 1:1000 biniodide, or 1 per cent. lysol. The pledgets must always be drawn from before backward to prevent carrying forward any septic matter from near the anus. No pledget must be used for more than one wipe. Previous to this the nurse should have seen to it that the rectum and bladder are emptied. It is well for her to give an enema in every case, irrespective of whether the bowels have acted naturally or not.

Infrequent Vaginal Examinations.—The use of abdominal palpation instead of this method of examination in normal cases is strongly recommended. Where a vaginal examination is necessary it must be done with scrupulous care. The patient should be on her back rather than on her side, so as to diminish the risk of the hand coming into contact with the anus. The hands and the vulva having been cleansed as described, the labia minora are held apart by the fingers of the left hand, and the fingers of the right hand introduced without coming into contact with the vulva at all, or at least only with the inner surfaces of the labia minora which have been cleansed in the way described. Try to ascertain—

(1) Presentation and position.

(2) Is the head engaged and fixed between pains?

LABOR, NORMAL

(3) Is the head flexed, and how far has it passed into the pelvis?

(4) Rate and character of fetal heart-sounds.

(5) State of fullness of the bladder.

(6) Duration and frequency of the pains. Are they true or false?

This ought in most cases to suffice. But if necessary the vaginal examination may then be made, the hands and the patient being suitably prepared. It is well to introduce the fingers during a pain and prolong the examination until it has passed off, so that one can learn the state of matters both during and between pains. Points to be ascertained or confirmed are—

(1) Is she in labor?

(2) State of os uteri—how far advanced in labor?

(3) Presentation and position.

(4) Are the membranes ruptured? If not, be careful not to rupture them.

(5) State of os, vagina, and perineum as to distensibility or rigidity, moistness, or dryness, etc.

(6) Is pelvis normal? (if not previously ascertained, as it should have been).

(7) Is cord prolapsed?

Diagnosis of Labor.—There are three signs: (1) The pains are true pains, *i.e.*, they are accompanied by hardening of the uterus felt by abdominal palpation, and by opening of the os and bulging of the membranes felt per vaginam. (2) The “show.” (3) In multiparæ the head is fixed between pains. In primiparæ engagement of the head occurs *before* labor.

False Pains.—These are painful, colicky contractions of the intestines, or bladder, or abdominal walls, or sometimes partial contractions of the uterus. They tend to come on before term, sometimes several days or even a week or a month before. They may be excited by some digestive upset, or by some purgative medicine that has failed to act properly, or by constipation. They are often extremely painful, but are characterized by irregularity of onset, by being situated more in front than in the back, and by the absence of any accompanying contraction of the uterus. They should be treated according to the cause—attention to the digestion, enema, emptying a distended bladder, and if necessary, sedatives.

Having completed the examination, again reassure the patient if all is well. If there is anything wrong, do not alarm the patient but tell the relatives. Under no circumstances commit yourself definitely as to the time when the labor will be over. Prognosis of this kind is impossible.

LABOR, NORMAL

The nurse should give the patient an enema whether the bowels have acted or not, unless this has already been done. The bed, the room, and the patient's clothes also need attention.

The Bed.—This should be arranged as follows:

(1) A narrow, single bed is best, and should be accessible on both sides.

(2) The mattress should be firm. Soft spring mattresses may be stiffened by placing a broad board beneath them.

(3) Mackintosh sheeting.

(4) Binding blanket.

(5) Two clean sheets. (These all to be tucked in under the mattress).

(6) Mackintosh sheeting hanging over the edge on the right-hand side.

(7) Pad of absorbent wool.

(8) The upper bedclothes according to the temperature of the room. The sheet should always be folded over and safety-pinned to the counterpane, so that all the clothes may be raised easily and quickly.

The carpet at the side of the bed should be removed or protected by waxcloth or stout paper and a tin bath or large basin placed so as to catch any blood or liquor amnii that may escape over the side of the bed.

If the patient is unable to afford mackintoshes, etc., several clean newspapers or sheets of glazed brown paper may be used.

The Room must be kept well ventilated, but not cold.

Patient's Clothing.—This should be light, but sufficiently warm. When she lies down at the close of the first stage, her hair should be plaited, a pair of clean stockings put on, and two nightdresses. Both should be clean, but one old. The old one is put round the lower part of the body. The other is put on in the ordinary way, and then tucked up under the arms, so that it can be brought down after labor is over, and all the soiled clothing, etc., removed.

When the second stage begins the patient should retire to bed. She should now be encouraged to bear down. To this end it is helpful to place a stool on the bed at the foot, so that during a pain she can put her feet on it and so get her lower limbs fixed. A roller towel should also be tied to the foot of the bed. To this she clings during a pain, and, holding her breath, bears down more effectively. Between pains she should straighten her legs again to avoid cramp. This cramp is easily excited by the muscular effort, plus the pressure of the head on the sacral nerves. Treat it by rubbing with hot cloths. The pain may be mitigated by the nurse pressing on the sacrum with her knee or fist.

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When the membranes rupture it is frequently desirable to make a vaginal examination to see that everything is right, and that the cord has not prolapsed. This must be done with all due antiseptic precautions. In most labors this is the only vaginal examination necessary, and even it may often be done without and the progress gaged by pelvic palpation from the abdomen.

If the os is *fully* dilated, and the membranes still intact, it will hasten delivery to rupture the membranes artificially. This can sometimes be done by nipping them between the fingers, but it is easier to use a sterilized instrument such as the stillette of a catheter, or a hairpin straightened out and sterilized by heating it to red heat in the fire, and washing it in antiseptics.

Sometimes the anterior lip of the cervix becomes enormously thinned out over the head, while the partially opened os is situated high up behind the head. In such a case try to pull down the os and stretch it gently with the fingers.

Anesthesia in Labor.—General anesthetics are very largely used to produce a degree of analgesia, merging into more or less complete anesthesia during the latter part of the second stage. Complete “surgical” anesthesia is not necessary or desirable in labor unless operative interference is required. A light anesthesia, known as “anesthesia to an obstetrical degree,” is sufficient in normal labor.

Chloroform.—Chloroform is most commonly used; but ether is also largely employed; and not a few obstetricians employ a mixture of both.

Chloroform should be given by the open method, and a flannel-covered mask is much the most economical means of administration. A beginning is made when the pains are such as to cause serious suffering, usually towards the very end of the first or beginning of the second stage. To begin with, a whiff should be given only during a pain, and the mask removed when the pain passes off. As the pains come in closer succession, the administration becomes gradually less intermittent, until by the time the head is being born the administration is practically continuous and the patient's condition is for a few minutes one of complete anesthesia. As soon as the child is born the mask is finally removed.

The administration of chloroform to this light degree of anesthesia by the intermittent method described is, speaking generally, a safe procedure during labor. Provided a sufficiently light degree of anesthesia is maintained, the efficiency of the uterine contractions is not impaired, and there is no tendency to inertia or to post-partum hemorrhage. Unduly prolonged or deep anesthesia, on the other hand, may lead to these dangers.

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It must not be assumed that the use of chloroform is devoid of risk. It only approaches that happy condition when it is administered with all due precautions and as described above. Further, there are certain maternal conditions which make the use of chloroform particularly risky. These are toxemic states, especially hyperemesis gravidarum, acute yellow atrophy of the liver, and eclampsia. In all of these the liver cells are already diseased, and the deep or prolonged administration of chloroform may lead to further damage, and even to death following "delayed chloroform poisoning."

A mixture of chloroform and ether may be employed exactly as pure chloroform is used. It is believed by some that the stimulant effect of the ether diminishes the risk attached to the chloroform.

Ether alone may be used, except where there are pulmonary complications such as bronchitis. It may be given by the open method by using the face-piece and dome of a Clover's inhaler without the bag.

Care of the Perineum.—A tear of the perineum is the commonest accident in the labor of a primiparous woman. Although not in itself dangerous, it may be a source of septic mischief in the puerperium, and later may cause much trouble and ill-health by favoring displacements of the uterus. Every effort should be made to avoid the accident.

The causes of perineal tears are three:

(1) Relative disproportion between the head and the outlet.

(2) Too rapid expulsion without the perineum having time to stretch.

(3) Faulty mechanism, whereby a larger circumference of the head than necessary passes through the outlet.

The means of combating these causes are as follows:

(1) In all cases give the head plenty of time to stretch the perineum.

(2) When the pains are strong and the head tends to advance too rapidly, give more chloroform to diminish the strength of the pains; try to prevent the patient from bearing down; retard the head by pressing it back with the hand. *Never* press on the perineum itself.

(3) Try to favor the maintenance of flexion. Press the sinciput upwards and forwards, and so force the occiput well under the subpubic arch. In this way the diameters brought over the perineum are the suboccipito-bregmatic and the suboccipito-frontal, and these are the smallest available diameters.

(4) Try to deliver between pains. By doing so we have

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the advantage of dealing with a perineum whose muscles are relaxed instead of tightly contracted.

When the head is born, support it in the right hand. Stop the chloroform. Do not unduly hasten the birth of the body unless the child's face becomes very cyanosed, and it makes convulsive movements. Feel round the neck for the umbilical cord, and if it does happen to be round the neck, draw a loop of it down and slip it over the head. Wipe the eyes with a pledget of wool soaked in boracic lotion. It is a good plan to wipe out the mouth in the same way.

If the uterus does not within a moment or two proceed to expel the shoulders, place the left hand on the fundus and rub it so as to stimulate a contraction. If necessary aid the expression by pressure, and in every case follow with the hand the descent of the fundus.

If the shoulders appear to stick, pass the right forefinger in and hook it into the anterior axilla, and pull down the shoulder. Do not pull on the head or neck to expedite delivery.

As soon as it is born the child should cry. If it does not do so, clear its mouth of mucus by means of a small swab, hold it up by its legs and gently slap it on the back. If necessary suck the mucus out of its trachea by means of a catheter. A little friction and sprinkling with a few drops of cold water usually stimulate it to inspiration.

Ligature of the Cord.—As soon as respiration is well established, lay the child on the bed on its back. Wait for a few minutes until the cord shows signs of ceasing to pulsate. Then take the cord at a spot about two inches from the umbilicus, squeeze away the Wharton's jelly so as to make it a thin cord, and apply a ligature, and tie tightly with a surgical or reef knot. Apply a second ligature about three inches from the vulva. The second ligature is not necessary unless there is a second child in the uterus, when it may save its life if the circulations of the two children communicate. In any case, however, it is a cleanly habit, and should always be done. Cut the cord between the ligatures half an inch from the umbilical ligature. Take care to hold the cord up on the fingers when cutting, otherwise you may easily injure the infant. The child should then be wrapped in a warm flannel, and laid aside in a safe warm place until the nurse is ready to bathe it. Take a second look at the cord to see that it is not bleeding. If it is, put on a second ligature.

The moment the child is born the third stage is begun. The great rule for the conduct of this stage is to keep control of the fundus of the uterus by the hand on the abdomen during the whole stage, and for some time after it. This is

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done so that one may feel at once if the uterus becomes very flabby or enlarged, which means bleeding inside it. Remember that the uterus must become somewhat soft in the intervals between contractions, but there should always be sufficient permanent retraction to prevent it from feeling actually *flabby*. Do not rub or knead the fundus unless you think it is becoming too soft, but if you do think so then grasp and knead it to stimulate it to contract again. Unnecessary and over-zealous rubbing up of the fundus is apt to lead to retention of the placenta by an irregularly contracted uterus, and that may mean serious and dangerous hemorrhage.

The correct way to keep control of the uterus is to sink the ulnar edge of the hand into the abdomen above and behind the uterus, and just keep it there in light contact with the uterus. As long as the outline of the uterus can be felt there is not likely to be any risk of serious hemorrhage.

The placenta usually comes away within twenty minutes. The placenta sometimes remains in the vagina, whose muscular walls are too weak to expel it. When this occurs it should be removed from the vagina.

If the placenta is in the vagina, knead the uterus to a contraction; and then grasp the uterus and press it gently and steadily downwards and backwards in the axis of the pelvic inlet. It will push the placenta out before it without the necessity of using any force.

As the placenta rolls out through the vulva it should be grasped by the hand to prevent its weight tearing the membranes. It should then be turned round several times so that the membranes are twisted into a sort of rope. This is generally sufficient to draw them gently out without tearing.

Retained Placenta.—Where the placenta is still in the *uterus* after the lapse of forty minutes it may be expelled by Crede's method. The uterus is grasped through the abdominal wall by placing the fingers behind it and the thumb over the anterior wall. *When it contracts* it should be squeezed from before backwards, and at the same time pressed downwards and backwards in the axis of the inlet. This maneuver should not be repeated more than once or twice, and *never attempted unless during a contraction*. Care should also be taken to grasp the uterus from back to front, not from side to side, as otherwise the ovaries may be squeezed and severe shock produced.

Pulling on the cord should never be employed under any circumstances.

Examination of the Placenta.—The placenta should be received in a clean basin, and later floated out in water to see that it and the membranes are quite complete. Hold the

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placenta in both hands, maternal side up. The various lobes should fit each other accurately, or if any tear has occurred the edges come together with a little gentle pressure. If a piece of the placenta has actually been left behind, the gap will remain obvious even after trying to press the edges together. Then place it in the basin and hold up the membranes. They should look large enough to have contained the fetus and liquor amnii. Look for any tears in the amnion, and if there is such, note if any vessels pass from the edge of the placenta to the tear. Such a condition indicates a secondary or succenturiate placenta.

Retained Membranes.—If much is left in the uterus it may cause bleeding. Therefore look out for any symptoms of this, and give a good dose of ergot. The membranes will probably come away with the lochia. *Very rarely* it may be wiser to explore the uterus with the fingers and remove them, but remember the risk of sepsis in such an operation.

Ergot.—After the placenta is born, but never until then, ergot may be given to favor uterine contraction and retraction. It is desirable to do so when the uterus is not contracting well, but in a normal case it is not necessary. It may be given by the mouth (half dram of the fluid extract), but preferably by a hypodermic needle passed directly and deeply into the gluteal muscles. There are several good preparations sold in glass capsules of sterilized and standardized solutions ready for injection.

Cleaning Up the Patient.—The vulva and surrounding parts must now be cleaned up. This must be done with care. Pledgets of sterile wool soaked in weak lysol solution ($\frac{1}{2}$ per cent.) are used. All wiping is done from before backwards, and no pledget used for a second wipe.

The absorbent pad upon which the patient has been lying is removed before the final washing, and the buttocks and thighs dried. The draw sheet and upper mackintosh sheet are then withdrawn, a vulvar pad placed on the vulva, and the binder slipped under the patient, who is again turned on her back. The vulvar pads are best made of Gamgee tissue, about ten inches long and four wide, sterilized, or scorched brown at the fire. Before fastening the binder feel the uterus to make sure that it is firm.

Binder.—A binder is not necessary, but it is a great comfort to the patient, and gives a grateful and comforting support to the pelvic joints and muscles, which are strained and weary. The lower edge of the binder must come about two inches below the trochanters. Fasten the lower part first and make it fairly tight. The part over the abdomen should never be so tight that you cannot slip your closed hand under it perfectly easily. The lower edge keeps the

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vulvar pad in position. Fix the binder with stout pins or safety pins.

Pulse.—Before finishing with the mother count the pulse. It is usually slow—below 80. If it is above 100 make sure that there is no sign of hemorrhage from or into the uterus. Anesthetics, especially scopolamine, may cause a slight quickening of the pulse, that is not of any bad significance.

Temperature.—This also should be taken at the close of labor. It should be below 99°. Frequently it is subnormal from the loss of body heat.

The Baby has meanwhile been lying wrapped in a flannel in some warm corner. The bath is now prepared with a little water at a temperature of about 100° F. Two or three inches of water is ample. First gently smear the child with olive oil. This softens the vernix caseosa, or white cheesy stuff covering it. Then gently wash it all over with soap, beginning at the face and head. The child should never be immersed, and its face should never come in contact with water that has been used for the body. After drying it, examine it for congenital defects such as imperforate anus, cleft palate, etc. It is very important to guard against a possible ophthalmia, by dropping two drops of 1 per cent. solution of silver nitrate into each eye. This makes the eyes red for a day or two, but may be the means of saving the child's sight.

Pay particular attention to the cord. Dry it very carefully, see that it is not bleeding. Powder it with some boracic and starch powder, and wrap it in a small dressing of dry sterile gauze. Lay this flat on the abdomen, and put on the binder, not too tight. This should be sewn, not pinned, together. The flexures of the groins and the cleft of the nates may be dusted with starch and boracic.

LACERATION

See WOUNDS.

LACTATION, DIET IN

Diet of Mother.—Her dietary need not differ materially from that to which she is accustomed. She must avoid indigestible foods or any article which has been proved to disagree with either the infant or herself.

Factors Regarding Secretion of Milk.—Constipation, worry, nervous excitement, and over-fatigue all have an unfavorable effect upon the secretion of milk and must therefore be avoided by the nursing mother.

The Bowels.—Constipation of the mother reacts quickly and unfavorably upon the health and comfort of the baby, hence it should be avoided by eating coarse breads, green

LACTIC ACID

vegetables, and fruits, when they do not disagree with the baby, by drinking plenty of water and taking a certain amount of outdoor exercise to keep her own health in good condition.

Stimulating the Milk Production.—When the milk supply is deficient it will be advisable for the mother to drink a glass of milk or a bowl of cereal milk gruel between meals. Alcoholic beverages are not necessary to insure an adequate secretion of milk. The milk or milk gruels answer the purpose more efficiently and without bad results.

Energy Requirements of Infant.—The average baby requires fifty calories per day per pound of body weight to cover his energy growth and development needs for the first three months of life, after which the rate of growth is less and his requirements decrease from forty-three to forty, then to thirty-five calories per day per pound by the end of his first year.

Amount of Milk Needed for Infant.—Approximately two and one-third ounces to each pound of body weight per day covers the needs of the average baby.

Fuel Value of Mother's Milk.—Each ounce of milk yields twenty calories.

The Making of Milk.—It has been estimated that for every calorie yielded by milk, two extra calories must be provided by food.

LACTIC ACID

Lactic acid is a thick, syrupy liquid formed in milk when it turns sour as a result of bacterial fermentation. It is also formed by the fermentation of milk sugar or grape sugar.

When taken internally, it acts like the other organic acids (see ACETIC ACID, CITRIC ACID, OXALIC ACID):

1. It increases the appetite and aids digestion.
2. It is said to increase nutrition.
3. It enters the blood as lactates and is excreted by the urine as alkaline carbonates.

It is principally used, however, as a local application to heal tuberculous ulcers of the pharynx or larynx, and to remove diphtheritic membranes. The applications are very painful.

Lactic acid is formed by the fermentation of bacteria in milk and is therefore contained in many fermented milks, such as Kumyss, Zoolak, Fermilac, etc.

Preparation

Lactic Acid; dose 5 to 30 minims.

This contains 75 per cent. of pure lactic acid.

LARYNX, SURGICAL CONDITIONS OF

LAMELLÆ

Lamellæ are small gelatin discs containing medicinal substances, which are inserted between the lower eyelid and the eyeball.

LAMINECTOMY

See SPINAL CORD, SURGERY OF.

LAPACTIC PILLS

See ALOES.

LARYNGECTOMY

See LARYNX, SURGICAL CONDITIONS OF.

LARYNX

The larynx, or organ of voice, is placed in the upper and front part of the neck, between the base of the tongue and the top of the trachea. Above and behind lies the pharynx, which opens into the esophagus, or gullet, and on either side of it lie the great vessels of the neck. The larynx is broad above and shaped somewhat like a triangular box, with flat sides and prominent ridge in front. Below it is narrow and rounded where it blends with the trachea. It is made up of nine pieces of fibro-cartilage, united by elastic ligaments, and moved by numerous muscles.

The glottis.—Across the middle of the larynx is a transverse partition, formed by two folds of the lining mucous membrane, stretching from side to side, but not quite meeting in the middle line. They thus leave in the middle line a chink, or slit, running from front to back, called the *glottis*, which is the narrowest segment of the air passages. The glottis is protected by the leaf-shaped lid of fibro-cartilage, called the *epiglottis*, which shuts down upon the opening during the passage of food or other matter into the esophagus.

The vocal cords.—Embedded in the mucous membrane at the edges of the slit are fibrous and elastic ligaments, which strengthen the edges of the glottis and give them elasticity. These ligamentous bands, covered with mucous membrane, are firmly attached at either end to the cartilages of the larynx, and are called the *true vocal cords*, because they function in the production of the voice. Above the true vocal cords are *two false vocal cords*, so called because they do not function in the production of the voice.

LARYNX, SURGICAL CONDITIONS OF

Foreign Bodies.—The most common way for foreign bodies to lodge either in the larynx, or further down in the

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trachea, is for the individual to swallow them. The symptoms which are produced will vary according to the size of the body and its location in the respiratory tract. Sometimes they are expelled by coughing; at other times they may remain. Cases are not rare in which the material has been of sufficient bulk to occlude the larynx, with death immediately ensuing from asphyxiation.

Treatment.—Slapping the patient on the back, or inverting him may dislodge the foreign body. Or, if the patient is not so fortunate, it may be removed with forceps under direct vision, or either a Killian or Jackson laryngoscope may be necessary. These are instruments designed to enter the larynx. The pharynx and larynx may be cocaineized, or the patient may be placed under deep anesthesia. The laryngoscope is passed through the mouth and pharynx into the larynx, the head and neck being bent backward, and the foreign body removed through the instrument.

Occasionally, the condition is so urgent that to relieve the asphyxia, an opening must be made into the trachea below the point of obstruction, so that air may enter the lungs. This opening of the trachea is spoken of as tracheotomy.

New Growths of the Larynx.—The larynx, like the other organs in the body, may be the seat of benign or malignant growths. Probably the most common of the benign growths is the papilloma. These growths may be removed in three ways: through the larynx with the aid of the laryngeal mirror; from without by performing a thyrotomy (an incision through the thyroid cartilage of the larynx), or through a Jackson or Killian laryngoscope. The instruments used for their removal may be the snare, curette, forceps or galvano-cautery.

Malignant Growths.—The symptoms of a cancer infiltrating the larynx may be very similar to those produced by the benign growths. Hoarseness, later loss of voice, respiratory difficulty, and pain are very common. Later when the growth extends and ulceration becomes evident, cough and pain on swallowing may be very evident. The only treatment is surgical. Either one-half or the entire larynx may be removed.

Laryngectomy.—As the name implies the operation is one in which the larynx is excised. The operation itself is preceded by a tracheotomy. This may be done as a preliminary operation one day, the remainder of the operation being performed at another time, or the entire operation may be done at once. (See TRACHEOTOMY).

Operation.—The first part of the procedure is practically the same as tracheotomy except that the trachea is blocked

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by the use of a Hahns canula. This is done to prevent the blood from the laryngectomy from leaking down the trachea into the lungs. The canula is simply a tracheotomy tube which has been previously boiled and to which is attached and securely fastened a sponge squeezed dry and dipped in a 10 per cent. ether solution of iodoform. The sponge has been previously sterilized by soaking in a 25 per cent. alcohol solution for several days. The tube with the sponge is introduced dry. After it is in the trachea from five to ten minutes there is usually enough moisture generated to swell the sponge and block off the larynx above. The technique of the operation is unimportant. The Hahns canula is taken out after eight hours and the tracheotomy tube introduced.

Post-operative Treatment.—Since the larynx has been removed and the pharynx has just been sutured, it is highly important that the patient be fed for the first few days by rectum. For the next four to five days feedings should be administered through the nose by catheter, and within a week, as a rule, the patient is able to swallow. Of course, in the beginning, only soft diet should be allowed. These patients are very much depressed because of the loss of voice, but they soon learn to whisper and make themselves understood.

LAUDANUM

See OPIUM.

LAUGHING GAS

See ANESTHETICS (NITROUS OXIDE).

LAVAGE

Lavage is a method of washing out the stomach.

Conditions in which a Lavage is most Commonly Used:—

1. In acute gastric catarrh due to irritant, toxic, decomposing substances, corrosive poisons or alcohol, etc.
2. In chronic gastritis in which the stomach may be enlarged or atrophied with lessened motor power and secretions.
3. In gastric carcinoma in which there is usually a lessened amount or a total absence of hydrochloric acid.
4. In persistent vomiting.
5. In some cases of intestinal obstruction with fecal vomiting.
6. In some cases of gastric ulcer, but here lavage is usually contraindicated.
7. Sometimes following operations, before the patient is

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conscious, to thoroughly wash out the stomach and free it from ether, and bile, etc., so as to prevent later discomfort, nausea and vomiting.

8. In dilatation of the stomach.

Lavage may be given for the following reasons: 1. To cleanse the stomach of undigested food, fermenting material, gases, toxic and poisonous substances or mucus.

2. To cleanse, give comfort and prolong life in carcinoma.

3. To stimulate peristalsis and the secretions in the stomach.

4. To check hemorrhage. A very hot or very cold solution is used with great caution.

It is **contraindicated** (or should be given with great caution) in:—1. Ulceration with hemorrhage or following a recent and very severe hemorrhage from the stomach due to ulcer or carcinoma, etc.

2. Uncompensated heart disease.

3. Aneurysm of the thoracic aorta.

4. Advanced pulmonary tuberculosis.

5. Apoplexy.

6. Cirrhosis of the liver causing obstruction of the portal circulation with varicose gastric veins which predispose to hemorrhage.

7. Advanced arteriosclerosis.

8. The habitual use is injurious and should be avoided.

Method of Procedure.—In giving a lavage the following *articles* will be necessary: a dressing rubber and draw sheet to protect the patient and the bed; a kidney basin in case the patient vomits; gauze handkerchiefs to wipe away the mucus, etc., and to cleanse the tube; a paper bag for the soiled handkerchiefs; a large pitcher containing the solution; a small pitcher for pouring; a pail for the return and a basin containing the stomach tube in cold water or ice. (A rubber catheter is used in giving a lavage to an infant.) This hardens the rubber, makes its passage easier and makes the taste and feeling less disagreeable to the patient. No lubricant is necessary or desirable, as any lubricant is disagreeable to the taste and increases the tendency to nausea and the normal mucus in the throat is usually a sufficient lubricant. This mucus is also increased when the tube is being passed. The *tube* used should be smooth and flexible, of medium size, but large enough to allow for the return of semi-solids without clogging. The end of the tube should be closed and rounded. The holes should be large and at the side, not at the end.

The *solution* may be plain water or water containing salt or bicarbonate of soda (one dram to a quart) which softens and dissolves the mucus. In cases of poisoning a solution

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of potassium permanganate, tannic acid, or silver nitrate may be used.

The *temperature* may be from 100° to 106° F. when used for cleansing. It may be tested by pouring the solution over the back of the hand, as differences of one or two degrees have little effect.

The *quantity* may be from two to six quarts, depending upon the condition. When given for cleansing the treatment is continued until the return is clear.

The physical and mental condition of the patient.—Reassure the patient about the total absence of danger, the certain great relief which will follow, and the fact that the discomfort, which is greatly lessened by lack of resistance, is only temporary. Explain that at first there may be gagging and vomiting, and a choking sensation, but that there will be no difficulty in breathing when the tube is once inserted properly. The insertion of the tube will be greatly aided if the patient swallows continually. The patient will probably struggle and invariably becomes cyanosed, but this is due to the choking and struggling and not to the tube having entered the larynx, which is possible under certain conditions, but not at all probable.

If the patient is very nervous or irrational, assistance will be necessary and a mouth gag should be used to prevent the patient from biting the tube.

The *time* and *frequency* of the treatments vary, but they should not be given within from five to six hours after a meal.

Before *passing the tube*, remove any false teeth or a plate which the patient may have. Remove all air from the tube by squeezing it between the fingers. It is not necessary to lubricate the tube (except when it is soft and recoils on itself or when the tissues are inflamed or ulcerated), as the mucus in the throat is sufficient and any lubricant tends to cause nausea. Occasionally it is necessary to paint sensitive parts with cocaine, but the patient soon becomes accustomed to the treatment.

Ask the patient to hold the head *slightly forward*. Holding the head back makes the act of swallowing, and therefore the passage of the tube, difficult. Pass the tube along the curve of the hard and soft palate into the pharynx and esophagus but avoid touching the back of the pharynx, if possible, as this causes gagging. Normally the upper end of the esophagus is closed; this prevents the entrance of air into the stomach. Ask the patient to take deep breaths, to breathe slowly with the mouth open, to say a-a, then to swallow continually if possible. This flattens the tongue and opens the esophagus and starts the contractions of its

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muscles which carry the tube downward. When the tube enters the esophagus there may be a muscular spasm. *Never try to force a passage*, as this only increases the spasm. Stop, ask the patient to breathe more slowly and deeply, then if the patient swallows, the spasm relaxes. There are two other constricted portions of the esophagus which may make the passage difficult—one a little below the opening, the other where the muscles of the diaphragm form a sort of sphincter around it, as it passes through the diaphragm. If the patient simply keeps on swallowing, the tube will pass without difficulty.

The *length of the tube to insert* varies with the patient. The esophagus begins at the sixth cervical vertebra and its lower end passes through the diaphragm opposite the tenth thoracic vertebra, to enter the stomach opposite the eleventh thoracic. In the adult the average length of the esophagus is about ten inches and the distance from the teeth to its opening is about six inches, making the distance from the teeth to the entrance of the stomach $15\frac{1}{2}$ to 16 inches. The average length of the tube inserted is about 18 inches.

When the stomach tube is in place, quickly fill the funnel; allow the water to run through, but before the funnel or tube is entirely empty refill it to prevent air from being drawn in. Never allow the tube to become empty, as this causes a very painful, dragging sensation in the stomach. Allow the fluid to run in slowly, never with force. When two or three funnelsful have been introduced, and before all the water has run through the tube, pinch the tube and invert the funnel over the pail and allow the fluid to siphon back. If you allow all the fluid to enter the stomach, leaving the tube empty, it will be difficult or impossible to obtain any siphonage. *Never* introduce more than one pint without siphonage, for in dilatation of the stomach large quantities may be retained causing increased discomfort and a resulting paralysis of the walls of the stomach. Continue the treatment until the return is clear unless there is pain or blood in the return or the patient shows signs of exhaustion; then discontinue and report the condition to the doctor.

When the treatment is given for the first time, the patient may vomit, the vomitus returning around the tube. If vomiting continues, it is usually advisable to remove the tube and to reinsert it after vomiting has ceased. Use gauze to cleanse the secretions and vomitus from around the mouth. Sometimes the return from the lavage comes back around instead of through the tube. This may be because the tube is clogged with a semi-solid substance or filled with air. When clogged, pouring in another funnel of

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water may dislodge the substance, or it may be necessary to remove the tube and cleanse it. To expel air, pinch the tube and squeeze through the fingers in order to create a vacuum and obtain suction. It may also be because the tube is not in the stomach; the tendency of the stomach is to expel it. When there is difficulty in obtaining the return or the flow stops it may help to move the tube up or down slightly or to pour in more fluid until the patient complains of a sense of fullness. When a nurse is giving the treatment, however, it is safest to pour in only one extra funnelful.

When the treatment is completed, pinch the tube tightly in front of the teeth (using gauze or the drawsheet) and withdraw it quickly to prevent food or fluid entering the larynx. Return the tube to the basin. Cleanse the patient's mouth and face; remove the draping and make the patient comfortable. Remove and cleanse the utensils. A mouth-wash, particularly if the patient has been vomiting, will be very refreshing.

The Care of the Stomach Tube.—When used for one patient only, the stomach tube need not be boiled after use as frequent boiling softens and renders it useless. It should be cleansed inside and out with cold water then with warm water and soap. If hung up to drain, spread the tube over a towel and do not allow it to bend at a sharp angle as this will cause the rubber to crack when dry.

When the same tube is used for other patients it should be boiled for from one to three minutes.

LAXATIVES

See CATHARTICS.

LEAD (PLUMBUM)

Lead is a heavy metal which forms salts by combining with acids, many of which are used in medicine.

Chronic Lead Poisoning

Chronic lead poisoning is the most common form of poisoning by metals. It occurs particularly in workers who are forced to handle lead or its salts, such as white lead or type, continuously. Painters, type setters, plumbers and glaziers are frequently affected, the lead being absorbed from the skin, or from the stomach or intestines when it gets on the food from the hands.

Occasionally, lead poisoning results from drinking water coming through lead pipes, or eating canned food from cans soldered with lead, or from food adulterated with lead; such as cakes colored with chromate of lead, etc. It often occurs

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from inhaling lead fumes in a room painted with lead paint, and from the absorption of ointments or solutions applied to wounds or ulcers.

The symptoms appear very slowly and vary in different individuals. They result from the lead affecting the alimentary tract, the blood and the nerves.

Symptoms.—1. Loss of appetite, nausea, metallic taste in the mouth and bad breath.

2. **“Lead line” on the gums.** This is a dark blue line of lead sulphide which is deposited at the junction of the gums and teeth. It may be absent if the teeth are kept very clean.

3. **“Lead Colic”** or painter’s colic.

This is a very characteristic symptom, and usually appears suddenly. The patient complains of severe cramp-like abdominal pains, usually beginning around the navel, and lasting for several days, after which they disappear but soon return.

4. **Obstinate constipation.**

5. Occasionally vomiting.

6. Slow, strong pulse.

Symptoms of the Nerves.—These appear later.

1. **Lead paralysis**, lead palsy or painter’s palsy. The extensor muscles of both forearms usually become paralyzed, and the hands drop as a result of the contractions of the flexor muscles (“drop wrists”). Other muscles may be similarly affected.

2. Loss of sensation in areas of the skin.

3. Sharp, shooting or boring pains around the joints (arthralgia).

4. Rarely, blindness, from affection of the optic nerve.

Treatment.—1. Individuals who are continually exposed to lead or its salts, can often avoid poisonous symptoms by keeping their hands and nails scrupulously clean, especially before eating, to avoid getting the lead particles in the mouth. They should move the bowels regularly, best by Epsom salts, and they should take dilute sulphuric acid in lemonade regularly. Their diet should contain plenty of milk.

The patients suffering from an attack of chronic lead poisoning should be treated in the following way:

1. The bowels should be moved regularly by magnesium or sodium sulphate, which also helps to neutralize the lead, forming lead sulphate, which is then excreted in the intestines.

2. Potassium iodide is given, which helps to eliminate the lead.

3. The lead colic is best controlled by atropine.

4. For the anemia, iron is given.

LECITHIN

5. The paralyses usually get well if carefully treated with electricity and massage.

Uses

Lead salts are used principally on ulcers and wounds, to contract the tissues, and to check bleeding.

The lead acetate is occasionally given to check diarrhea.

Preparations

Lead Acetate (Sugar of Lead); dose 1 to 5 grains.

Solution of Lead Subacetate (**Liquor Plumbi Subacetatis**) (Goulard's Extract).

This contains about 25 per cent. of lead subacetate. It should be diluted, about 2 drams being used to a pint of water.

Dilute Solution of Lead Subacetate (**Liquor Plumbi Subacetatis Dilutus**).

This contains 4 per cent. of the solution of lead subacetate.

Lead Plaster (**Emplastrum Plumbi**) (Diachylon Plaster). This consists of lead oxide, soap and water.

Adhesive Plaster (**Emplastrum Adhæsivum**).

This consists of rubber, lead plaster and vaselin.

Soap Plaster (**Emplastrum Saponis**).

This consists of soap, lead plaster and water.

Diachylon Ointment (**Unguentum Diachylon**).

This consists of lead plaster, olive oil and oil of lavender.

LECITHIN

Lecithin is a phosphorized fat. It consists of various salts of fatty acids such as oleic, stearic and palmitic acids combined with glycerophosphoric acid and various protein substances. It is present in large quantities in nerve tissue. It is also present in various foods, especially in egg yolk and many vegetable foods. For medicinal purposes, it is made from egg yolk.

Lecithin increases the nutrition of the body, though it is not nourishing in itself. It increases the number of red blood corpuscles and the hemoglobin. It is used principally as a tonic.

It is given by the mouth in doses of 2 to 8 grains in pills, or hypodermically in doses of 15 minims, or in 15 per cent. solutions in oil.

Preparations

Lecithin Solution (containing 1 grain of lecithin); dose 1 dram.

This is a 2 per cent. solution of lecithin in glycerin and alcohol. Its action and uses are the same as those of lecithin.

LEECHING

Lecithol; dose 1 dram.

It is a 2 per cent. emulsion of lecithin in alcohol. It is obtained from the brains of hogs.

LEECHING

Leeching is a method of abstracting blood for the purpose of relieving local inflammation or acute congestion. It is often used in preference to the knife, which would leave a scar and might cause excessive bleeding.

"The leech (*hirudo*) is an annelid worm with a sucker at each end of its body. At its mouth end there are three teeth arranged in a triradiate manner so that its bite consists of three short deep gashes radiating from a common center" (Bastedo).

Although leeches may be found in the ponds and marshlands of America, in medicine the imported leech, chiefly from Sweden, is used. The Swedish leech is considered the best because it extracts about half an ounce of blood, while the American leech only extracts from one to two drams.

The Action of the Leech.—The mouth of the leech, after its bloodsuckers are attached, secretes a substance (*hirudin*) which prevents the coagulation of blood so that it flows freely. After the leech is removed, some of this substance may remain in the tissues so that the hemorrhage may persist for some time. The effect produced is one of counterirritation as well as depletion.

Conditions and Areas to which Leeches are most commonly Applied: 1. To the temple or nape of the neck in meningitis.

2. To the temple, the forehead, in front or behind the ear for inflammation of the eye or ear.

3. Behind the ear to relieve cerebral congestion.

4. In the treatment of swollen joints after sprains, etc.

Disadvantages in the Use of Leeches: 1. They may not be clean and in any case are not aseptic.

2. They may wander and get in one of the body cavities, such as the ear, nose, vagina, etc.

3. They remove an uncertain quantity of blood.

4. They may have a bad psychic effect on a nervous patient.

When not in use the leech is kept in a jar of clean, fresh water, with a little sand in the bottom, and the jar must be tightly closed with a perforated cover.

Method of Application.—The *skin* must be clean, shaved if necessary, and free from odors, or the leech will not take hold. Prepare the skin as for an incision but do not use disinfectants leaving an odor. Dry with a sterile wipe. Be sure the leech attaches itself to the desired spot only.

LEPROSY

To insure this place it in a glass tube so that the head comes first—the head is recognized by its three-cornered mouth. Hold the tube over the spot and do not remove it until the leech has taken hold, so as to prevent it from migrating. It must not be placed over a vein but over a spot where pressure may be made if necessary to control bleeding. Leech-bites make small, permanent scars, so they are not usually applied on the face or other conspicuous parts.

If the leech will not take hold, it may be coaxed or stimulated by placing a little sweetened milk or water on the spot or by pricking the spot with a sterile needle and drawing a drop of blood. Gently stroking the back of the leech sometimes helps. Putting the leech in very cold water for a minute or two is one of the very best ways of arousing its appetite. The patient should never be left alone because of the wandering habits of the leech. For safety, the cavities of the nose and ears, etc., may be plugged with cotton, especially the ear when the application is near the ear. To prevent the uncomfortable sensation of contact with the body of the leech, a layer of gauze is placed between it and the skin after it has taken hold.

Removal of the Leech.—The leech must never be forcibly removed or its teeth or suckers will remain and cause continued bleeding and inflammation in the part. (In any case the bleeding may persist, so it is wise to protect the bed before making the application.) When it has drawn enough blood, the leech may easily be removed by sprinkling it with a little salt or by squeezing its head. When satisfied, it will drop off of its own accord. On removal it should be destroyed immediately. Cover it with salt and then burn. Never use it a second time. Never throw it down the drain pipe or in the garbage tin alive. After removal, if there is no hemorrhage, apply a sterile dressing. If bleeding continues, and is prolonged, it may exhaust the patient, so it is necessary to control it. It may be controlled by applying a sterile dressing and a tight bandage with pressure or by astringents or styptics such as adrenalin, alum or tannic acid or by applying ice compresses with a tight bandage.

LEPROSY

Leprosy is a disease due to a germ which is probably as closely allied to the germ of tuberculosis as the paratyphoid germ is to the typhoid germ, or as the bovine tuberculosis germ is to the human tuberculosis germ. Its incubation period is unknown but is supposed to be a matter of many years; its prodromal period is perhaps one to two years. Recovery is very rare, so that the fastigium usually cor-

LEUCORRHEA

responds with the remainder of the patient's life, which may be many years.

Leprosy, apparently, begins in the nose, with ulceration, etc. It may then affect chiefly the skin (tubercular form), or chiefly the nerves (anesthetic form) or occur in mixed form.

It is of interest as being one formerly widespread disease which has been banished by segregation; the leprosaria of Europe several centuries ago being more numerous than our tuberculosis sanatoria are now.

It is of interest also because of its relatively non-infectious character and the intimate and prolonged character of the contact usually necessary to its spread.

LEUCORRHEA

See MENSTRUATION.

LEVANT WORM SEED

See SANTONICA.

LICE

Three forms of lice are common, in the human, the head louse, the body louse and the pubic louse or "crab." They also have the four stages from egg to adult and, in this country, seem to be restricted to annoyance of their host, although if once infected they may carry, by biting, typhus fever, trench fever and perhaps relapsing fever.

The **head louse** fastens its eggs to the hairs and although a mixture of equal parts of kerosene and olive oil, soaked into the hair over night, will kill all stages, the egg shells still remain, and are best removed by soaking in warm vinegar and then using a fine-toothed comb.

Body lice, on stripping the infested person, will be found chiefly along the seams of the clothing. A thorough bathing of the infested person, with sterilization of the clothing (baking, steaming, gasoline, etc.), will secure their riddance.

"**Crabs**" cling close— "blue mass" (mercury ointment) or strong disinfectant solutions will dislodge them, but shaving the affected parts is almost a prerequisite.

Fleas, leaving infected rats to bite the human, are the chief means of carriage of the bubonic plague.

Bedbugs, by biting an infected person, may carry on their mouth-parts some of the infections to their next victim, but no particular disease has been associated with them as yet.

Wood-ticks carry the Rocky Mountain spotted fever, a very serious and fatal disease found in a rather limited area in Montana and vicinity.

The **itch-mite**, about $\frac{1}{100}$ of an inch in diameter, is re-

LIQUID PETROLATUM

sponsible for scabies or "the itch." The female burrows into the skin to lay its eggs and lies at the bottom of the burrow. These eggs develop and the impregnated females move on to make new burrows in the same person or in a new victim who comes too closely into contact with the first.

This disease, an exceedingly irritating and, if neglected, possibly fatal disease (fatal from irritation, sleeplessness, infection of the scratched areas, etc., is readily cured by treatment with sulphur ointment. Obstinate cases may be painted with Balsam of Peru.

LICORICE

See GLYCYRRHIZA.

LIGATURE

See HEMORRHAGE.

LIME

See CALCIUM.

LINIMENTS

Liniments are liquid or soft preparations of drugs which are applied by rubbing on the skin. The drug is usually dissolved in alcohol or in an oily substance.

Liniments are usually applied for their soothing effect. They should be applied on a piece of flannel or lint which keeps the skin warm, prevents evaporation of the liniment and thereby helps the action. Many liniments are applied by vigorous rubbing. Whatever effect is then produced is due principally to the vigorous massage and very little, if any, to the liniment itself.

LINSEED (LINUM)

Linum (linseed or flaxseed) is the dried ripe seed of *Linum usitatissimum* or the flax plant.

Flaxseed meal is the ground dried seeds and is used principally as a poultice. The seeds themselves are often given in the form of an infusion (flaxseed tea) to relieve bronchitis, painful urination and painful defecation.

LIQUEURS

See ALCOHOL.

LIQUID PETROLATUM (MINERAL OIL)

Liquid Petrolatum, **Mineral Oil** or **Liquid Paraffin** is a heavy oily substance which is obtained from petroleum oil. Chemically it belongs to the group of hydrocarbons. It is on the market under various names: Liquid Vaseline; Liquid Albolene, etc. Russian mineral oil is the same

LIQUOR ANTISEPTICUS

substance obtained from Russia, but is much heavier than the American product.

Applied locally mineral oil is bland and soothing to the skin and mucous membranes.

When taken internally it is not absorbed. When it enters the intestines it becomes mixed with the intestinal contents which it protects from the action of the digestive juices. The water of the intestinal contents is therefore not absorbed and the mass of feces gradually becomes increased. This distends the intestines and bowel movements result. At the same time it lubricates the mucous membrane of the intestines.

Mineral oil is used as a laxative especially in chronic constipation; which is frequently due to a weakened condition of the intestinal muscles or to delicate kinks or adhesions of the intestines.

It is given in doses of 4 to 8 drams, two or three times a day.

It occasionally causes nausea and it frequently has a tendency to ooze from the rectum between stools.

Administration.—Liquid Petrolatum or mineral oil should be given about two or three hours after meals, undiluted. As it has a bland taste, which patients usually do not like, it should be flavored with some aromatic substance such as peppermint or cinnamon water.

LIQUOR ANTISEPTICUS

See BORIC ACID.

LISTERINE

See BORIC ACID.

LITHIUM SALTS

See SALINE DIURETICS, and SALINE PURGATIVES.

LIVER AND GALL-BLADDER

The liver is the largest gland in the body, weighing ordinarily from fifty to sixty ounces. It measures eight to nine inches from side to side, six to seven inches from front to back, and four to five inches from above downward in its thickest part. It is a reddish brown organ, placed directly below the diaphragm, in front of the right kidney, the pyloric end of the stomach, and the upper part of the ascending colon. The upper convex surface fits closely into the under surface of the diaphragm. The under concave surface of the organ fits over the right kidney, the upper portion of the ascending colon, and the pyloric end of the stomach.

LIVER, SURGICAL CONDITIONS OF

The liver is connected to the under surface of the diaphragm, and the anterior walls of the abdomen by five ligaments, four of which are formed by folds of peritoneum, and the fifth, or round ligament, is a fibrous cord resulting from the atrophy of the umbilical vein of intra-uterine life.

The gall-bladder.—The gall-bladder is a pear-shaped sac lodged in the gall-bladder fissure on the under surface of the liver, where it is held in place by connective tissue. It is about four inches long, one inch wide, and holds about ten drams.

LIVER, SURGICAL CONDITIONS OF

The diseases which commonly involve the liver from a surgical standpoint are injuries to the liver, abscesses of the liver and cirrhosis of the liver.

Injuries to the Liver.—The liver may be injured by direct or indirect violence; it may be torn, with an ensuing hemorrhage. This must be treated by immediate laparotomy, packing the tear with gauze, or by suturing the tear of the liver with mattress sutures, employing a round, non-cutting liver needle. The suture material is usually chromic catgut.

Abscess of Liver.—This may be of pyogenic origin, or the direct result of amebic dysentery. These abscesses may be opened and drained directly through the abdomen, or if the abscess is high, an operation may be performed through the posterior lateral area of the chest. The parietal and visceral pleura are sutured together, and after adhesions have taken place, so as to seal off the pleural cavity, the liver is drained through this area. In this way no pus flows through the abdominal or peritoneal cavity, or through the pleural cavity. This operation is done in two stages: the first being a partial resection of the rib, with the suturing of the parietal and visceral pleura; the second is the drainage of the abscess through the area of the adhesions.

Cirrhosis of Liver.—As this condition is associated with a filling of the peritoneal cavity with fluid (ascites), and as it is presumably due to an obstruction of the portal circulation, an attempt is made to establish a collateral circulation by the Talma operation (omentopexy).

Twenty-four hours prior to operation, an ordinary paracentesis abdominalis is done. The patient is then operated upon, and a portion of the omentum brought through the anterior abdominal walls in the mid line and sutured to the subcutaneous tissues. In this way the omental veins will establish collateral circulation with the internal mammary vein, thereby lessening the strain of the portal system.

The one important factor in post-operative treatment is when a patient strains, the abdomen should be firmly held

LOBELIA

so as to prevent further evisceration of the abdominal contents along with the omentum.

And see GALL-STONES.

LOBELIA

Lobelia is obtained from the leaves and tops of the *Lobelia inflata* or Indian tobacco; its active principle is an alkaloid, **lobeline**.

When taken internally, lobelia produces the following effects:

1. It increases the secretions of the stomach and intestines, often causing nausea and vomiting, and occasionally frequent movement of the bowels.

2. It lessens the contractions of the involuntary muscles of the bronchi.

3. It increases the secretions.

4. The pulse is usually slower, but soon becomes rapid and weak.

5. The breathing is somewhat slower.

Poisonous Effects

An overdose of lobelia usually causes the following symptoms:

1. Nausea, and profuse vomiting.

2. Occasionally frequent movements of the bowels.

3. Great weakness and relaxation of the muscles.

4. Collapse (rapid, thready pulse, slow, shallow breathing, cold, moist skin, and dilated pupils).

5. Convulsions, stupor, coma and death from paralysis of the breathing.

Uses

Lobelia is occasionally used to relieve the spasmodic cough of whooping cough and asthma; but because of its dangerous poisonous effects, its use has mostly been given up. It is occasionally used in the form of an infusion, to relieve poison ivy rash.

Preparations

Fluidextract of Lobelia; dose 1 to 5 minims.

Tincture of Lobelia; dose 10 to 60 minims.

LOCOMOTOR ATAXIA

See TABES DORSALIS.

LOGWOOD

See HÆMATOXYLON.

LOTIO FLAVA

See MERCURY.

LUMBAR PUNCTURE

LOTIO NIGRA

See MERCURY.

LOZENGES

Lozenges are flat discs consisting of a drug made up with sugar or tragacanth or any demulcent substance.

LUGOL'S SOLUTION

See IODINE.

LUMBRICIDES

Lumbricides are drugs which destroy round worms. Round worms are small, cylindrical worms which are often found in the small intestine of children.

See ANTHELMINTICS.

LUMBAR PUNCTURE

Lumbar puncture consists in the introduction of a suitable needle into the subarachnoid space of the spinal canal and the withdrawal of cerebrospinal fluid for diagnostic or therapeutic purposes. It also consists in the withdrawal of fluid for the purpose of injecting serum as a therapeutic measure and drugs to produce spinal anesthesia.

Dangers involved in a Lumbar Puncture.—1. In operations or in a lumbar puncture, the drainage or escape of cerebrospinal fluid may be so great as to deprive the medulla of its water-cushion, causing it to rest directly on the uneven bony surface of the skull. The resulting irritation may cause convulsions and may even interfere with the vital functions of the heart, respirations and vasomotor systems. There are reported cases of unconsciousness, death from respiratory paralysis, pain and partial paralysis resulting from this treatment.

2. A sudden fall in pressure may result in very dangerous circulatory disturbances which may prove fatal.

3. Injury to the spinal cord may result.

4. Infection may be carried in.

5. Injury to the cauda equina, shown by twitching of the muscles of the lower extremity, may occur.

Conditions and Purposes for which a Lumbar Puncture is Performed: 1. To relieve pressure in hydrocephalus, in tuberculous and syphilitic meningitis, in uremia, in convulsions in children and in epidemic meningitis due to the meningococcus. In epidemic meningitis, sometimes the canal is drained, that is, the fluid is allowed to flow until the pressure is so reduced that only three or four drops come per minute. The canal is then irrigated by introduc-

LUMBAR PUNCTURE

ing the same amount of normal saline and again draining. Then anti-meningitis serum, warmed to body temperature, is injected *very slowly* under the least possible pressure. The dose of serum is usually 20 c.c. or a little less than the amount of fluid withdrawn, which may be 25 c.c. The dose may be repeated every twelve hours or even every eight hours, and is repeated until the spinal fluid is clear.

2. Fluid is withdrawn for the purpose of injecting tetanus antitoxin.

3. Fluid is withdrawn for diagnostic purposes.

4. In syphilis involving the nervous system fluid is withdrawn for the purpose of injecting serum obtained from the blood after the patient has received an intravenous injection of salvarsan.

A lumbar puncture is **contraindicated** in a brain lesion or suspected brain tumor. If fluid is necessary for diagnosis not more than four to six c.c. are withdrawn and this is not done unless absolutely necessary.

Method of Procedure.—The treatment must be carried out with the strictest aseptic precautions.

Watch the patient's color, pulse and respiration during and after the treatment.

When the patient's condition permits, he may be told the nature of the treatment and that it involves only slight pain. The pain of the skin puncture is prevented by a local anesthetic of cocaine; the passage through the dura and the stretching of the periosteum sometimes causes considerable pain.

The *position* of the patient is important. He should lie on his *left side* near the edge of the bed with his knees drawn up as near as possible to his chin so as to separate the vertebræ. The upright position, with the patient leaning forward, his arms resting on a chair or bed rest, is sometimes used, but this position is said to be inadvisable because it is difficult to measure the pressure of the spinal fluid, and sudden falls of pressure in the spinal canal, as previously stated, are likely to set up dangerous circulatory changes (Wood).

The puncture into the subarachnoid space is usually made in the interspace between the third and fourth lumbar vertebræ or between the fourth and fifth lumbar vertebræ.

The *skin* is carefully disinfected and the area draped with sterile towels. The doctor wears sterile gloves. All the articles used must be sterile. A hypodermic needle and syringe loaded with cocaine, two lumbar-puncture needles, three sterile test tubes, sterile cotton, a sterile dressing and adhesive will be required. Sometimes a dry sterile aspirating syringe is required.

LUTEIN

The patient must remain perfectly quiet during the treatment.

After the treatment he should be kept quiet in bed for at least twenty-four hours in order that equal pressure may be established in the cerebrospinal cavity and no unpleasant symptoms result from the procedure.

See CEREBROSPINAL FLUID.

LUNGS

The lungs are cone-shaped organs which occupy almost all of the cavity of the thorax that is not taken up by the heart, the large blood-vessels, the lymphatics, and the esophagus. Each lung presents an outer surface which is convex, a base which is concave to fit over the convex portion of the diaphragm, and a summit or apex which rises half an inch above the clavicle. On the inner surface is a vertical notch called the **hilum**, which gives passage to the bronchi, blood-vessels, lymph-vessels, and nerves.

The **right lung** is the larger and heavier; it is broader than the left, owing to the inclination of the heart to the left side; it is also shorter by one inch, in consequence of the diaphragm rising higher on the right side to accommodate the liver. The right lung is divided by fissures into three lobes, upper, middle, and lower.

The **left lung** is smaller, narrower, and longer than the right. It is divided into two lobes, upper and lower. The front border is deeply notched to accommodate the heart.

Pleura.—Each lung is enclosed in a serous sac, the pleura, one layer of which is closely adherent to the walls of the chest and diaphragm (parietal); the other closely covers the lung (visceral). The two layers of the pleural sacs, moistened by serum, are normally in close contact; they move easily upon one another, and prevent the friction that would otherwise occur between the lungs and the walls of the chest with every respiration. Inflammation of the pleura is called pleurisy.

Mediastinum.—The mediastinum is the space left in the median portion of the thorax between the pleural sacs. It extends from the sternum to the spinal column, and contains a portion of many organs, *i.e.*, the trachea, esophagus, great vessels connected with the heart, lymph-nodes, thoracic duct, and various nerves.

LUTEIN

This is a substance made from the corpus luteum of the ovaries of the cow. It is used to relieve painful and scanty menstruation and the nervous symptoms usually associated with this condition.

LYCOPODIUM

LYCOPODIUM

This consists of the spores of *Lycopodium clavatum* or club moss. It is used principally as a soothing dusting powder and in the making of pills.

LYSOFORM

Lysoform is a combination of lysol and formaldehyde which is used as a disinfectant in 5 to 10 per cent. solutions.

LYSOL

Lysol is a 50 per cent. solution of cresols dissolved in soap. It forms a frothy solution in water and is used for douches and other irrigations in $\frac{1}{2}$ to 1 per cent. solutions.

M

MAGENDIE'S SOLUTION OF MORPHINE

This is a 1 to 30 solution of morphine sulphate (or 16 grains to the ounce). This is a solution which is very commonly used for hypodermic administration. It should always be fresh, as a fungus often grows in old solutions, and makes it unfit for use, or it may change the morphine to apomorphine.

MAGNESIUM

The preparations of magnesium act similarly to those of calcium.

1. They neutralize the acid in the stomach.
2. They are not readily absorbed, passing into the intestines, where they act as cathartics, causing frequent fluid stools.
3. The small amount of magnesia that is absorbed increases the alkaline reaction of the blood.

Preparations

The preparations of magnesium, which are principally used to neutralize the acid in the stomach, are:

Magnesium Oxide (calcined or light magnesia); dose 5 to 60 grains.

Milk of Magnesia; dose 1 to 4 drams.

This is a proprietary preparation containing magnesium hydrate. It is used as an antacid and cathartic.

Magnesium Sulphate (Epsom salt); dose half a dram to one ounce.

This is soluble in $1\frac{1}{2}$ parts of water.

Magnesium sulphate is very commonly used. It has a very unpleasant taste and is best given in seltzer or vichy.

Large doses produce very frequent stools, with a good deal of griping. (See SALINE PURGATIVES.)

MALARIA

Malaria is a disease caused by a unicellular organism, a protozoön called the **Plasmodium malariae**. This organism is injected into the blood of the patient when bitten by a

MALE FERN

species of mosquito, the **anopheles**. The organisms then enter the red blood corpuscles, where they grow and develop into other similar organisms in 48 or 72 hours, depending on the type of organism. At the end of this time, the red blood corpuscles burst and the newly formed malarial parasites and poisonous substances, together with the hemoglobin of the red blood corpuscles, are thrown into the blood.

As a result of the sudden destruction of a large number of red blood corpuscles, and the liberation of poisonous substances, the patient has a chill. The violent muscular contractions which are thus produced, elevate the temperature several degrees, and since this temperature is excessive, it is followed by sweating, which gradually reduces it to normal again.

These chills, fever and sweats occur every other day, if the organism which causes these symptoms is the **tertian type**, or the one which develops in 48 hours. They occur every third day, if the organism is the **quartan type** or the one which develops in 72 hours. In other cases, the chills, fever and sweats occur every day. This is due to the fact that the patient is infected with two types of tertian organisms, each one developing every 48 hours, but on alternate days. The attacks always occur regularly at about the same time during the day.

See **QUININE**; and **MOSQUITOES**.

MALE FERN (ASPIDIUM)

Male fern or **filix mas** is obtained from the underground stems of the **Dryopteris filix mas** and of **Dryopteris marginalis**. The chief active principle is **aspidin**.

When taken internally, male fern has a very unpleasant, nauseous taste, and it **destroys tape worms and hook worms**.

Poisonous Effects

In some individuals, if large doses of the drug are given, it may be absorbed and cause:

1. Abdominal pain.
2. Nausea, vomiting and diarrhea.
3. Muscular twitchings.
4. Convulsions, collapse, coma, and death.

Administration

The oleoresin or fluidextract is usually given, either in pills, capsules or as a suspension in mucilage.

Preparations

Oleoresin of Aspidium; dose $\frac{1}{2}$ to 2 drams.

Filmaron; dose $2\frac{1}{2}$ drams.

MANNERISMS

This is a substance obtained from an ethereal extract of aspidium. It is said to be safer than aspidium.

This is a 10 per cent. solution of filmaron in castor oil.
See ANTHELMINTICS.

MALT

Malt is a barley grain which has been made to grow artificially. The growth is then stopped by means of heat.

During this growth the starch contained in the barley is changed to sugar by means of diastase, a ferment which is contained in the barley grain.

Malt which contains this ferment, diastase, is often given to help the digestion of starch. Many of the preparations used contain no diastase and produce no digestive effects; though they are easily digested foods. Many of the malt extracts contain alcohol, and are therefore similar to beer or stout.

Preparations

Extract of Malt; dose 4 ounces.

This is an extract of malt in syrup.

Maltine, Maltzyme and others.

MANGANESE

Manganese is a metal. Many of its preparations are occasionally used in medicine. It is found in the body in the red blood corpuscles, the hair and bile, usually together with iron. Some of its preparations, especially potassium permanganate, are used as an antiseptic.

It is said to increase nutrition and is frequently given together with iron. It cannot replace iron, however, as it does not help to form hemoglobin.

Preparations

Manganese Sulphate; dose 2 to 8 grains.

Manganese Hypophosphite; dose 3 grains.

Potassium Permanganate; dose $\frac{1}{2}$ to 3 grains.

This preparation gives off oxygen; it is often given in cases of poisoning from various drugs. For example—in morphine poisoning it is given to neutralize the morphine by the oxygen which the potassium permanganate liberates, which then combines with the drug and makes it inactive.

It is also used as an antiseptic, acting in a similar manner, the oxygen destroying the bacteria.

MANNERISMS

Mannerisms are peculiarities of conduct shown in the ordinary simple movements or activities: grimaces, queer

MASTITIS

or bizarre movements, baby talk, etc. These also may be the responses to hallucinations.

MASTITIS

Acute Mastitis.—Acute inflammations of the breast, known as acute mastitis, usually occur in women during the close of the lactating period. It is the result of improper hygiene of the nipples, although this may not always be the case.

Symptoms.—The patient may complain of pain and heavy feeling in the breast, and, at the same time, redness, swelling, and areas of hardness may appear in certain parts of the breast. There is a rise in temperature, an increase in the pulse rate, loss of appetite, slight headache, and a feeling of general malaise.

Treatment.—If pus has not yet formed, the breast is elevated with the bandage in such a way that it is firmly supported upward. This will do much to relieve the pain, but care should be taken that the binder is not applied too tightly. Nursing, as a rule, is discontinued, and if the breast throbs and feels distended, the milk may be expressed regularly either by gentle massage, the direction of the massage being a stroking motion from the circumference of the breast towards the nipple, or the milk may be aspirated by a breast pump. During the interval, either hot applications such as flaxseed poultices, may be applied to the breast, or cold applications in the form of a magnesium sulphate solution of 50 per cent. strength. When pus is formed the abscess is opened by the surgeon and freely drained. After the acute suppurative process has subsided the drainage tubes are shortened gradually and the granulation tissue stimulated by silver nitrate.

Chronic Mastitis.—This condition is not uncommon, and presumably is due to a chronic inflammation of the breast. The patient complains of vague and indefinite pains localized in the breast itself, and, on examination, there may be found here and there some very small nodules which may be tender. At times the lymph glands in the axilla (arm-pit) show enlargement; as a matter of fact this condition is frequently difficult to distinguish from cancer of the breast.

Treatment.—Sometimes a well-fitting breast binder will relieve much of the pain. If there is considerable induration or hardness of the tissue, warm fomentations may bring relief. Should these measures fail, most surgeons will remove that portion of the breast which is pathological. If at the time of operation it is thought that the condition might be cancerous, the entire breast and deeper tissues are removed.

MEDICINES, ADMINISTRATION OF

MASTOIDS

See EAR NURSING.

MASTOIDITIS

See BRAIN ABSCESS.

MATZOON

Matzoon, or kefir kumyss, is made by fermenting milk with a kefir fungus, a fungus obtained from **Caucasia** in Russia. It is also known as zoolak.

MEASLES, NURSING IN

Isolate. Use precautions as in scarlet fever. Keep room dark. Cleanse eyes with boric acid solution 2 per cent. Doctor may order argyrol (18 per cent.) dropped in eyes. Patient not to become chilled. Omit bed and tub baths until temperature has been normal two or three days and all rash disappeared.

Complications.—Croup, pneumonia, diphtheria, otitis media and enlargement of the cervical glands. Watch the character of the stools, especially with small children.

Diet.—Liquids until temperature is normal; then soft and regular diet. If there is no discharge from nose or throat disease is not thought communicable after rash disappears.

(See INFECTIOUS DISEASES, COURSE OF.)

MEASURES

See WEIGHTS AND MEASURES.

MEDIASTINUM

See LUNGS.

MEDICINES, ADMINISTRATION OF

Accuracy

While preparing medicines the nurse should concentrate her entire attention upon the work. She should not be disturbed by other duties.

1. When calculating doses be sure your answer is correct; verify it if in doubt.

2. Familiarize yourself with the smallest and largest doses of the remedies you are giving. If you think the maximum dose has been exceeded always verify it.

3. Always look **three** times at the label of every bottle or box before using any of its contents: when taking it from the closet, when removing the contents, and when returning the bottle or box to the medicine closet.

MEDICINES, ADMINISTRATION OF

4. Never use medicines from an unmarked bottle, or when you are in doubt as to the nature of the contents.

5. When pouring fluids, hold the bottle with the label pointing upwards so as to avoid soiling it.

6. Measure the quantities as ordered; do not give a teaspoonful when a dram is ordered and *vice versa*. Measure the quantities with graduated measuring glasses or marked glass spoons. Do not use household utensils unless the others are not available.

7. When measuring fluids hold the graduates so that the surface of the fluid, which is usually curved, is on a level with the eye. The quantity is read when the lowest part of this curve is on a line with the mark of the desired quantity, thus:



8. Never pour a medicine back into the bottle.

9. A medicine which forms a precipitate with another substance should always be given alone. Such medicines are said to be **incompatible**

10. Give all medicines at times ordered; b. i. d. medicines should be given at 8 A. M. and 6 P. M., t. i. d. medicines should be given at 8 A. M., 12 M. and 6 P. M.

11. Always stand at the patient's bedside until the medicine is taken.

12. Never allow one patient to administer medicines to another.

Time of Administration

The time to administer most remedies is not as important as patients frequently imagine. For certain effects, however, certain times of administration are preferable to others.

Remedies should be given **before meals** for the following effects:

1. To aid the appetite or to increase the secretion of digestive juices.

2. For a local effect on the stomach or intestines. When the substances are irritating they should be given in milk.

Remedies should be given **after meals**, for the following effects:

1. To neutralize digestive juices when these are present in excess.

2. To aid absorption and produce rapid effects.

3. Remedies which are given for absorption, but which are irritating to the tissues.

Cathartics should be given **between meals** on an empty

MELANCHOLIA, INVOLUTION

stomach. Those acting slowly should be given at night. Those acting quickly should be given in the morning.

Rules for Administration by Mouth

1. For a rapid, general effect give the substance diluted in a large quantity of water immediately after meals, thus aiding absorption.
2. For a slow, gradual, general effect give substances in small quantities of syrup, milk or wine between meals, to retard absorption.
3. For a local effect on the stomach or intestines give the substance in acacia or mineral oil, thus lessening absorption.
4. Time as indicated above.

Protection of Mouth and Teeth

Remedies which are injurious to the teeth, such as iron or acids, should be given through a glass tube or straw.

Administration to Children

To children medicines should always be given in fluid form. Special care should be taken to thoroughly disguise substances having an unpleasant taste. Pills, tablets or capsules should not be given to children as they are apt to chew these preparations before swallowing them.

Administration to Unconscious or Insane Patients

Unconscious or insane patients who are unwilling to take medicines should be given substances only in fluid form. The medicines should be dropped on the back of the tongue with a small spoon. To insane patients it is frequently necessary to administer medicine through a narrow stomach tube passed through the nose.

MELANCHOLIA, INVOLUTION

This is a form of mental disease which occurs after middle life, characterized by an anxious depression, developing slowly and pursuing a prolonged course.

Physical symptoms.—Insomnia, loss of appetite, loss of weight, palpitation and dyspnea, with feelings of distress or discomfort in the chest and about the heart.

Mental symptoms.—The patient is irritable, anxious, fearful, often very sad; has delusions of persecution, misfortune and self-accusation, of some sin committed many years before for which punishment must be endured; and may have hypochondriacal ideas. Orientation is not disturbed; memory is not much impaired, but there may be some retardation of thought. Hallucinations of sight and hearing may be present. In conduct the patient is restless, agitated, moves about uneasily, picks and rubs the face, pulls the ears,

MENOPAUSE

bites the nails and knuckles, repeats over and over such phrases as "Save me," or "Let me go home," etc.; or, the patient may be mute and inactive, overwhelmed with despondency and have suicidal tendencies.

Nursing procedures.—Rest in bed with liberal diet supplemented by special nourishment is usually prescribed. Food is often refused because of the delusions. Regularity in bathing and elimination should be established. When the patient is fearful and apprehensive and seems stubborn and resistive, explanation of what is about to happen or to be done will help to allay the fear and afford relief and comfort for a little while. Avoid pulling, pushing or forcing the patient, and by persuasion accomplish what is desired even though a good deal of time is consumed. If persuasion fails, the attention should be diverted and results obtained by other methods. It may be necessary to bandage the hands if the patient picks much at the face, but it is far better to employ them by some form of light work. It should be remembered that the agitated, restless movements are largely reflex, and are the outward expression of the painful thoughts and feelings. These activities should be controlled by occupation, for any work which may be done by the hands makes demands on attention which will, for the time at least, crowd out the disturbing thoughts. Watchfulness is necessary at all times to prevent self-injury and destruction. Other nursing procedures are much the same as in the depressive psychoses.

MENOPAUSE

See MENSTRUATION.

MENORRHAGIA

See MENSTRUATION.

MENSTRUATION

Menstruation is the term applied to the series of changes characterized by a discharge of blood and mucus from the uterus, which recurs in woman from puberty to the menopause at regular intervals of about a month, except during pregnancy and lactation. *Synonymous terms* are the menses, the catamenia, or the monthly periods; and there are many euphemisms employed, such as "being unwell," etc.

The time at which menstruation first starts is generally the signal that the girl has become, physiologically speaking, a woman, capable of conception and childbirth. It therefore corresponds to what is more often called *puberty*. The actual age at which it occurs varies in different individuals, in different races, and in different parts of the world. In this country the great majority of girls begin to menstruate

MENSTRUATION

between the ages of 13 and 17, the average being 14½. Differences of race and climate account for some differences, although perhaps not to the extent formerly believed. Social conditions have probably more effect upon the time of the onset. Rich food, luxury, and early mental stimulation bring it on early in the better classes. Dwellers in towns and cities start sooner than country girls.

The onset of puberty is accompanied by a number of other changes both bodily and mental. These are the growth of the pelvis and its assumption of the adult female shape; the development of the external genitals; the appearance of hair on the pubes and in the axillæ; the development of the breasts; and a general development of a graceful, rounded contour. Mentally the changes are in the direction of an increasing reserve, and the awakening of the sexual sense. These changes come on gradually, and the body does not become that of a fully developed woman until the age of about 20. This latter age is known as that of *nubility*—the earliest age at which pregnancy and childbirth can *safely* take place.

Clinically the start of menstruation may be quite sudden, or may be preceded for several months by periodic headaches and general upsets of health, without any actual discharge of blood.

The **Menopause** is the time when menstruation ceases to recur. It is often spoken of as the "climacteric," or the "change of life." It usually occurs between 40 and 50, and rather oftener after 45 than before it. Before 40 and after 50 are quite unusual, although by no means unknown. There is no definite relationship between the age of the onset and the age of cessation of menstruation. As often as not an early start means a late menopause, and a late start an early cessation. The menopause is usually associated with other changes presumably due to the withdrawal of the ovarian internal secretion, as well as the stoppage of the monthly periods. There may be nervous, digestive, circulatory, and even mental symptoms. The cessation of menstruation may come on abruptly, or slowly. Frequently there is a certain amount of irregularity before it stops altogether. After the menopause has become established the sexual organs undergo retrogressive changes. The internal generative organs atrophy, and the breasts shrivel. Excess of fat is frequently deposited, or masculine characteristics may appear, such as the growth of hair on the face.

Clinically it is a time requiring close watching. Scrupulous attention should be paid to general hygiene, and any symptoms treated as they occur. *Particular care should be taken to investigate cases in which hemorrhage returns after*

MENSTRUATION

a definite absence of some months at this time. Such cases are frequently cases of early cancer of the uterus, and, if recognized at once, may be treated by operation with some considerable hope of permanent cure.

Menstrual Type.—This term refers to the interval between one period and the next. Such intervals should always be counted from the beginning of one period to the beginning of the next. The commonest type (75 per cent.) is the twenty-eight day type, the whole cycle of changes occurring regularly every twenty-eight days. In other cases the interval is thirty days, in others only twenty-one. Usually, however, in a healthy woman the same type is adhered to throughout, and as long as it is regular it is generally perfectly consonant with good health. Irregularity usually indicates some pathological condition.

Menstrual Habit.—This term refers to the duration of menstruation, and indirectly to the amount of loss. The average duration is five days, but it varies greatly in different persons. The extremes are cases where it only lasts an hour or two, and cases where it goes on for eight or ten days. Anything below two and above eight days is abnormal. The duration is affected by the same influences as affect the time of the first onset, being greater in hot climates, less in cold; greater in town dwellers, and in those living in luxury and eating stimulating food. Sexual stimulation and habits of thought tend to increase it—in short, “high living and low thinking.”

Amenorrhea.—This means the absence of menstruation during the active sexual period of life from puberty to the menopause. Amenorrhea is one of the early symptoms of pregnancy, and it occurs in 60 per cent. of women during lactation.

Menorrhagia means excessive hemorrhage at the menstrual period.

Metrorrhagia means bleeding from the uterus in the intervals between menstrual periods.

Dysmenorrhea means painful menstruation.

Leucorrhea means a discharge of a white or yellowish nature—not blood.

Clinically menstruation is accompanied by symptoms of a general nature in the majority of women—the so-called menstrual *molimina*. There is frequently a feeling of heaviness and weariness. Dark lines appear under or around the eyes. The nervous system is more susceptible, and reflex irritability increased. The symptoms of other diseases tend to become exaggerated at the onset of menstruation.

The temperature is said to be slightly lower during the period, and there is often a feeling of chilliness. The

MENTAL DEFICIENCY

excretion of urea is diminished and the blood pressure falls. There is also a diminution in the calcium content of the blood in the general circulation during the flow.

From a purely clinical standpoint menstruation naturally divides itself up into the three periods of invasion, persistence, and decline. The period of invasion lasts only a few hours and is characterized by an increased flow of mucus as well as a feeling of heaviness and malaise. This is rapidly followed by the actual discharge of blood—the stage of persistence—which lasts for two to four days. Later the period of decline supervenes, characterized by a gradual diminution in the flow of bright blood, and a return to a mucus flow as at the beginning. This last phase usually lasts only one or two days, the whole period gradually coming to an end.

MENTAL DEFICIENCY

This is a condition where from birth, or through accident or disease at an early age, there is a lack of normal development of the mind, in consequence of which the individual is incapable of performing his duties as a member of society in the position in which he is born. **Feeble-mindedness**, as it is commonly called, is a permanent condition and cannot be cured, but a good deal can be done in many cases to improve, or, at any rate, make the most of what mentality there is.

Certain **physical deformities** or “**stigmata**” are common in these conditions,—the shape of the skull, the shape and position of the ears, the shape of the palate, deformities of the nose, irregularities of the teeth, differences in the length of the arms and legs, etc.

“**Binet-Simon Intelligence Tests**,” are tests designed to show not only the degree of defect, but also which of the mental faculties are chiefly involved.

Nurses in the industries, in schools and social service are more and more being called upon to make application of these tests in their work. A form of the tests is given but this work should only be undertaken after special training for it has been gained, preferably by instruction by a psychologist or other qualified teacher.

BINET-SIMON TESTS FOR INTELLIGENCE AGE

(Form arranged for the Johns Hopkins Dispensary.)

Mentality of One and Two Years

1. Eye follows light.
2. Block placed in hand is grasped and handled.
3. Suspended cylinder is grasped when seen.
4. Candy is chosen instead of block.

MENTAL DEFICIENCY

5. Paper is removed from candy before eating, child having seen the wrapping.

6. Child executes simple commands, and imitates simple movements.

Mentality of Three Years

7. Touches nose, eyes, mouth, and pictures of these as directed.

8. Repeats easy sentences of six syllables, with no error.

9. Repeats two numerals.

10. Enumerates familiar objects in pictures.

11. Gives family name.

Mentality of Four Years

12. Knows own sex.

13. Recognizes key, knife, penny.

14. Repeats three numerals in order, when heard once.

15. Tells which is longer of lines differing by a centimeter.

Mentality of Five Years

16. Discriminates weights of 3 and 12 grams, 6 and 15 grams.

17. Draws, after copy, a square that can be recognized as such.

18. Repeats "His name is John. He is a very good boy," and similar sentences.

19. Counts four pennies.

20. Rearranges a rectangular card that has been cut diagonally into two triangles.

Mentality of Six Years

21. Knows whether it is forenoon or afternoon.

22. Defines, in terms of use, the words fork, table, chair, horse, mamma, three satisfactorily.

23. Performs three commissions given simultaneously.

24. Shows right hand, left ear.

25. Distinguishes pretty from distinctly ugly or deformed faces, in pictures.

Mentality of Seven Years

26. Counts 13 pennies.

27. Describes pictures shown previously in No. 10.

28. Notes omission of eyes, nose, mouth, or arms, from as many portraits, three of the four.

29. Draws diamond shape, from copy, so that it can be recognized.

30. Names red, green, blue, yellow.

MENTAL DEFICIENCY

Mentality of Eight Years

31. States difference between paper and cloth, butterfly and fly, wood and glass, in two minutes, two satisfactorily.
32. Counts from 20 to 1 in twenty seconds, with not more than one error.
33. Names days of the week in order, in ten seconds.
34. Counts values of six stamps, three ones and three twos, in less than fifteen seconds.
35. Repeats five numerals in order, when pronounced once.

Mentality of Nine Years

36. Gives correct change from a quarter paid for an article costing four cents.
37. Defines in terms superior to statements of use, in No. 22.
38. Names the day, month, day of month, year, allowing error of three days either way on day of month.
39. Names the months in order, allowing one omission or inversion, in fifteen seconds.
40. Arranges, in order of weight, boxes of same size and appearance weighing 6, 9, 12, 15 and 18 grams, in three minutes. Two out of three trials.

Mentality of Ten Years

41. Names a penny, nickel, dime, quarter, half dollar, two, five and ten-dollar bills, in forty seconds.
42. Copies design after ten seconds' exposure.
43. Repeats six numerals.
44. Tells what one should do in various emergencies, and answers questions difficult of comprehension.
45. Uses three given words in two sentences.

Mentality of Eleven Years

46. Detects nonsense in three out of five statements, in about two minutes.
47. Uses three given words in one sentence.
48. Gives at least sixty words in three minutes.
49. Names three words that rhyme with *way* in one minute.
50. Rearranges shuffled words of 8-word sentences, two out of three, with one minute for each.

Mentality of Twelve Years

51. Repeats seven numerals in order, when heard once.
52. Defines charity, justice, goodness, two satisfactorily.
53. Repeats, with no error, sentence of 23-26 syllables.
54. Resists suggestion as to length of line.

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55. Infers correctly the fact indicated by circumstances given, in each of two trials.

Mentality of Fifteen Years

56. *Interprets* pictures shown in Nos. 10 and 27.

57. Imagines clock-hands interchanged for hour 12.20 and for hour 2.56, telling the time.

58. Writes "caught a spy" in symbols after learning code, one error permitted.

59. Writes correctly the opposite of seventeen out of twenty given words.

Mentality of an Adult ("Over 15 Years")

60. Imagines and draws results of cutting triangle from side of twice folded paper.

61. Imagines and draws new form produced by joining the transposed pieces of diagonally divided rectangular card.

62. Distinguishes between abstract terms of similar sound and meaning (evolution—revolution, event—prevent, etc.).

63. Gives three differences between the president of a republic and a king.

64. Gives the central thought of a selection, read to him.

MENTAL DISEASES, NURSING IN

In every branch of medicine there has come the realization that the practice of nursing is an integral part of the practice of medicine, and a most important element of treatment. In no branch is this more true than in psychiatry, and coincidentally with the increase of interest and research in the treatment of disorders and diseases of the mind, has come a demand for nurses who are specially trained in the art and practice of nursing mental diseases.

In the early days of the "asylum," when the patient was deprived of his liberty by commitment for the protection of society and himself, very little scientific study leading to diagnosis, grouping or medical treatment was given, and the nurses' duties were largely custodial. But to-day the best mental hospitals are laboratories of research where every known scientific measure may be applied and brought to the aid of the patient in order that he may be cured, if possible, or at least that his condition may be so improved that he may be returned to society.

The application and carrying out of many of these measures requires intelligent coöperation and skill on the part of the nursing staff. To ensure this end, many mental hospitals have established schools of nursing, maintaining affiliations with general and special hospitals for courses in subjects which they cannot adequately give; and others

MENTAL DISEASES

provide special courses in the nursing of nervous and mental diseases for nurses who have received previous training in general hospitals.

The course in mental nursing as prescribed by the best schools includes lecture courses and instruction in the subjects of psychology, psychiatry, psychotherapy, psychoanalysis, reëducation, occupation therapy, hydrotherapy, mechanotherapy, electrotherapy, massage and diversions. Frequent clinics and demonstrations of nursing procedures are also provided, and ample opportunity for the practical application of nursing measures is given under efficient direction and supervision.

The importance of training in the field of mental nursing is constantly being more widely recognized and insisted upon as a part of the equipment of every nurse, and schools of nursing in general hospitals which have not the facilities for giving a course are providing it by affiliation with the best mental hospitals. Among the better known mental hospitals are: Butler Hospital, Providence, Rhode Island; McLean Hospital, Waverly, Massachusetts; Boston Psychopathic Hospital, Boston, Massachusetts; Bloomingdale Hospital, White Plains, New York; the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore, Maryland; Cook County Psychopathic Hospital, Chicago, Illinois; Iowa Psychopathic Hospital, Iowa City, Iowa; State Psychopathic Hospital, at the University of Michigan, Ann Arbor, Michigan; and Syracuse Psychopathic Hospital, Syracuse, New York.

In increasing numbers general hospitals are establishing psychopathic departments as a part of the hospital unit. In these hospitals the course in nursing mental diseases is an integral part of the general training. Among these hospitals are: Letterman General Hospital, Presidio, San Francisco, and the Los Angeles County Hospital, California; Walter Reed General Hospital, Washington, D. C.; Newark City Hospital, Newark, New Jersey; Bellevue Hospital, New York City; King's County Hospital, Brooklyn; Albany Hospital, and Buffalo City Hospital, in New York State; Cincinnati General Hospital, and Cleveland City Hospital, in Ohio; Philadelphia General Hospital and St. Francis Hospital, Pittsburg, in Pennsylvania.

The state hospitals are rapidly falling into line and are providing a better and more intelligent nursing service for the large numbers of patients for whom they care. Many of these hospitals have schools of nursing in which excellent standards are maintained.

In the field of public health no more interesting or important work presents itself to the well trained nurse than

MENTHOL

that of mental hygiene. The Smith College Training School for Social Work at Northampton, Massachusetts, offers a summer course in psychiatric social service with training centers in Boston, New York, Cincinnati and Minneapolis; and the New York School of Social Work, 105 East 22nd Street, New York City, offers a similar course to young women desirous of preparing themselves for this branch of nursing.

MENTHOL

Menthol is a camphor-like substance (steareptene) obtained from the **oil of peppermint**. It produces a feeling of coolness on the skin and mucous membranes, and produces local anesthesia. The anesthesia is not sufficiently marked, however, to enable a surgical operation to be performed. It is used principally to relieve painful conditions of the skin.

MERCURIALISM

See **MERCURY**.

MERCURY (HYDRARGYRUM)

Mercury or quicksilver is a silver-colored liquid metal which evaporates very easily. Many of its salts are used in medicine.

Appearance of the Patient

A few hours after giving an average dose of a preparation of mercury, the patient usually has several movements of the bowels and more urine is passed. The stools are soft, colored with bile, and accompanied by a little griping. Occasionally the flow of saliva is also slightly increased.

If small doses of mercury preparations are given continuously for weeks or longer, to a patient suffering from the first or second stage of syphilis, the symptoms, such as the original ulcer or chancre, the rash on the body, the mucous patches in the mouth, and the swelling of the glands, all gradually disappear.

Local action: **Applied to the skin**, mercury preparations are excellent antiseptics. If a strong solution is used, or even a weak solution continuously, redness, pain and itching of the skin will result. If a strong solution is kept in contact with the skin for a long time, inflammation and even destruction of the skin may result.

Mucous membranes are shrunk and contracted by the action of mercury preparations (astringent action).

Internal Action: **In the mouth:** Mercury preparations have a distinct metallic taste, and contract the mucous membrane.

MERCURY

In the stomach: They slightly increase the secretions, occasionally causing nausea.

In the intestines: Mercury preparations increase the secretions and peristalsis, causing frequent soft stools stained with bile. They also act as intestinal antiseptics.

Action after Absorption

Mercury salts are readily absorbed into the blood from all the mucous membranes, from the lungs, and even by the skin. When given by mouth, they are absorbed in 1 to 2 hours. After absorption, they affect principally the intestines, the kidneys, some of the secretions, the nutrition of the tissues, and if given steadily, they act as a specific for the first and second stages of syphilis.

Action on the kidneys: Mercury salts increase the flow of urine.

Action on the secretory glands: All the secretions, especially the saliva and pancreatic juice, are increased.

Action on nutrition: Small doses of mercury preparations, if given for some time, increase the nutrition of the tissues, and the body weight.

Specific Action in Syphilis

Syphilis is a chronic infectious disease, caused by the *Spirochæta pallida*, a spiral-shaped organism. The infection begins with the formation of a hard ulcer, or **chancre**, usually on the genital organs. This is known as the first stage of the disease. It is followed in about six weeks, by an eruption all over the body (**roseola**), whitish patches in the mouth (**mucous patches**), and **swelling of all the lymph glands** throughout the body. This is known as the second stage of the disease. Some time later, in several months or years, or at any time during the patient's lifetime, he may suffer from various diseases, which result from the formation of **gummata**. Gummata are areas of round cells which readily decompose, forming a thick fluid in the center. Any organ of the body may be affected in this way, producing many and varied symptoms. The occurrence of these late symptoms is known as the third stage of the disease.

Parents infected with syphilis may transmit the disease to their children. The children may be born dead, or they may suffer, if they live, at any time during their childhood from various symptoms which are characteristic of the third stage of the disease in the acquired form.

Effect of Mercury

Mercury preparations, if given steadily to a patient suffering from the first or second stage of syphilis, usually

MERCURY

relieve all the symptoms in a very short time. The rash and the mucous patches soon disappear, the glands become smaller; until they, too, finally disappear. This curative action of mercury in syphilis is probably due to the destruction of the *spirochæta pallida*, the organism which causes the disease.

Excretion

Mercury preparations are excreted mainly by the kidneys and the intestines, and also slightly, by all the excretions, such as the saliva, milk, bile, gastric juice, etc. They are very slowly eliminated from the body, usually in one or two days. Some of the mercury often remains in the body for a long time afterwards, and may then be gradually excreted for some time.

Acute Mercury Poisoning

Acute mercury poisoning usually results from one of the mercury salts, such as the bichloride of mercury tablets, taken with suicidal intent.

Symptoms.—1. Metallic taste in the mouth, and burning pain in the throat.

2. Cramp-like, abdominal pains.

3. Nausea and vomiting; the vomited matter contains bile and later blood.

4. Diarrhea with bloody stools.

5. Scanty urine which may contain blood.

6. Collapse, as a result of the profuse vomiting and diarrhea; rapid, weak, irregular pulse, the face is pinched and anxious, the skin is cold and moist, the breathing slow and shallow.

7. Convulsions and coma may occur before death.

Usually the patient lives several days or weeks; he develops a very severe acute nephritis characterized by scanty, bloody urine, which contains albumen. He finally develops uræmia with convulsions, coma and death.

Death from mercury poisoning usually occurs in from one to seven days.

Treatment.—1. The antidote for mercury poisoning is white of egg, milk or flour. These substances contain albumens, which combine with the mercury, forming an albuminate of mercury, and thus prevent the poisonous effects. About one egg should be given for every 4 grains of bichloride of mercury or other preparation taken.

2. Opium or morphine is given to check the diarrhea, and to keep the patient quiet.

3. The collapse is treated with heart stimulants such as caffeine, atropine, strychnine, etc.

MERCURY

“Mercurialism”

Mercurialism is a very common condition which results from prolonged use of mercury preparations. Syphilitic patients can often take large doses of mercury without developing any poisonous effects.

Symptoms.—The following are the symptoms of excessive mercury action:

1. **Profuse flow of saliva**, and a metallic taste in the mouth. This is soon followed by:
2. **Soreness and bleeding of the gums**, later ulcerations of the gums, mouth or throat, loosening of the teeth, and even destruction of the jaw-bone. The breath has a very foul odor from the destroyed tissue.
3. **Diarrhea**, often with bloody stools.
4. **Anemia**.
5. **Loss of weight**.
6. **Scanty urine**.
7. **Paralysis of the hands or feet** with “drop-wrists” or “drop-feet.”

Treatment.—1. Stop the administration of mercury.

2. The soreness of the gums is best relieved by a potassium chlorate mouth wash or a tannic acid mouth wash. The gums are often painted with tincture of myrrh.

3. The diarrhea is best checked by opium.

Uses

Mercury preparations are used principally:

1. **As a specific for the first and second stages of syphilis.**
2. Many of the preparations are excellent antiseptics.
3. Some of the preparations are excellent purgatives.
4. Mercury is said to have a very beneficial effect in relieving acute infections of the serous membranes, such as pleurisy or peritonitis. It also reduces enlargements of lymph glands.

Administration

1. For absorption from the skin, mercury is applied by “**rubbings**” or **inunctions** in the form of an ointment. The ointment is thoroughly rubbed on the skin for six days, every day on a different region of the body; thus, one day on the arms, another day on the forearms, the thighs, the legs, the back, etc. On the seventh day the patient is given a bath to remove the ointment from the skin; and then the course is begun again.

In giving mercury inunctions, the nurse should protect her hands with leather gloves, as otherwise she herself may absorb the drug, and develop poisonous effects.

Mercury is also given for absorption by the skin, in the

MERCURY

form of vapor. The patient sits in a closed cabinet over a lamp containing burning calomel. The fumes thus generated are absorbed by the skin. Some mercury preparations are frequently given by mouth.

An excellent method of giving mercury is by deep injections into the muscles. The preparation is usually injected into the muscles of the buttocks, which are then rubbed very thoroughly to hasten the absorption.

Preparations

Bichloride of Mercury, Corrosive Sublimate (Hydrargyri Chloridum Corrosivum); dose $\frac{1}{50}$ to $\frac{1}{10}$ of a grain.

This is rarely used internally. It is principally used as a local antiseptic in 1:1000 to 1:5000 solutions. It usually comes in tablets of $7\frac{1}{2}$ grains each, which are dissolved in water to make up the required strength. Corrosive sublimate cannot be used to disinfect instruments, as it stains them black.

Mild Mercurous Chloride, Calomel (Hydrargyri Chloridum Mite); dose $\frac{1}{10}$ to 5 grains.

This preparation is used principally as a cathartic. It is given in tablets or as a dry powder on the tongue.

Blue Mass (Massa Hydrargyri); dose 2 to 8 grains.

This is mercury rubbed with glycerin, honey, licorice, althea, etc., and contains $33\frac{1}{3}$ per cent. of mercury. It is used principally as a cathartic, in the form of pills; each pill containing 3 to 5 grains of blue mass.

Mercury with Chalk, Gray Powder (Hydrargyrum cum Creta); dose 2 to 8 grains.

This is a gray powder made like blue mass, but it contains chalk in addition to the other ingredients. It is used as a mild cathartic.

Yellow Iodide of Mercury, Protoiodide of Mercury (Hydrargyri Iodidum Flavum); dose $\frac{1}{8}$ to 1 grain.

Red Iodide of Mercury, Biniiodide of Mercury (Hydrargyri Iodidum Rubrum); dose $\frac{1}{50}$ to $\frac{1}{10}$ of a grain.

Solution of Arsenic and Mercuric Iodides (Liquor Arseni et Hydrargyri Iodidi) (Donovan's Solution); dose 5 to 20 minims.

This contains 1 per cent. each of arsenic iodide and the red mercuric iodide.

Mercurial Ointment, Blue Ointment (Unguentum Hydrargyri).

This is made by thoroughly rubbing together mercury, oleate of mercury, lard and suet. It is used principally for inunctions.

Ointment of Yellow Mercuric Oxide (Unguentum Hydrargyri Oxidi Flavi).

METHYL SALICYLATE

This contains 10 per cent of yellow oxide of mercury.

Ointment of Red Mercuric Oxide (Unguentum Hydrargyri Oxidi Flavi).

This contains 10 per cent. of red oxide of mercury.

Ointment of Red Mercuric Oxide (Unguentum Hydrargyri Ammoniati).

This contains 10 per cent. of ammoniated mercury.

Ointment of Mercuric Nitrate (Unguentum Hydrargyri Nitratis), Citrine Ointment.

This contains 7 per cent. of mercuric nitrate.

Black Wash (Lotio Hydrargyri Nigra).

This consists of 1 dram of calomel to 1 pint of lime-water. It is used as an external application.

Yellow Wash (Lotio Hydrargyri Flava).

This consists of half a dram of corrosive sublimate to 1 pint of lime-water. It is used as a local application.

Mercuric Salicylate (Hydrargyri Salicylas); dose $\frac{1}{20}$ to $\frac{1}{8}$ of a grain.

This preparation is now frequently used, especially for intramuscular injections. For these injections, a 10 per cent. solution in water or liquid paraffin is used, of which 10 minims is injected deep into the gluteal muscles every fourth day.

MESOTHORIUM

See RADIUM.

METHYL SALICYLATE

Methyl salicylate may be artificially prepared from carbolic acid, or it may be obtained from the oil of gaultheria or wintergreen which is contained in the volatile oils of the birch and wintergreen. The oil is 96 per cent. methyl salicylate.

Methyl salicylate is used as a counterirritant chiefly in acute and chronic articular rheumatism.

Method of Application.—The oil may be painted over the part, or it may be placed on lint or on a compress which is wrapped around the joint. The application is then covered with oiled muslin to prevent evaporation.

When the pain is not too acute, the oil may be rubbed on the part, in this way combining the stimulating effect of the rubbing with the irritating and stimulating effect of the oil. This increases its counterirritant effect and adds to the comfort of the patient. Of course, when this method is used, as the oil is volatile, some of its effects are lost. The diminished stiffness, the increased warmth and comfort which result, however, testify to the increased benefit due to the rubbing.

METHYLENE BICHLORIDE

After the application is made the part is covered with a compress or lint and oiled muslin (to prevent evaporation and loss of heat) and bandaged. Frequently the part is covered with flannel or bandaged with flannel bandages in order to increase the warmth and comfort.

METHYLENE BICHLORIDE

See ANESTHETICS.

METHYLENE BLUE

Methylene blue is a chemical substance which forms a deep blue solution in water. It is used principally as a urinary antiseptic in gonorrhea, and as a specific for malaria. It stains the urine a blue or dark green color. It is given in capsules, in doses of 2 to 8 grains.

METRIC SYSTEM

See WEIGHTS AND MEASURES.

METRRORRHAGIA

See MENSTRUATION.

MILK

No food has so far been discovered which can be effectually substituted for milk. There is no food, however, which requires more attention in its selection and care. It is very susceptible to both odors and flavors, absorbing them both readily, as will be found if milk be placed in the same compartment with foods of strong odor and flavor, without being properly covered and protected. This is particularly noticeable with cucumbers, melons, etc.

Milk also furnishes a splendid medium for bacterial growth, and if left exposed to the air, put into unclean receptacles, or kept in a warm place, will immediately become more or less contaminated, after which it is unwise to use it. Sterilization and pasteurization will in a measure overcome the bacterial contamination, but milk purchased from a dairy which is not clean or milked under unsanitary conditions will remain dirty, hence unfit for human consumption. When the morning's milk supply is brought to the house it should be in clean, well-stoppered bottles, but before placing it in the icebox the tops of the bottles should be carefully wiped off with a wet cloth to remove any superficial dust which may be adhering to them. Every time a portion of the milk is removed thereafter the tops should be again cleansed before the milk is poured out. This is a wise precaution, and often prevents contamination from the hands, etc.

MILK

The amount of water in milk prevents its being an adequate food for adults except in certain pathological conditions. However, it furnishes a supplementary food unequaled by any other beverage known. There are fortunately only a few individuals who are unable to drink milk. There are many who fancy they cannot do so, but if the nurse has the ingenuity to utilize some of the various methods whereby milk is made more digestible, it will generally be found that the patient can take it without trouble. In cases of personal dislike, if the milk is flavored or colored or made up into soup, cocoa, chocolate, junket, custards, blancmange, etc, it will usually prove acceptable.

It must be understood that no matter what method is used to insure purity in milk, nothing does away with the necessity for keeping the milk both clean and cold. The receptacles in which the milk is allowed to stand, the vessels in which it is measured, and the person who handles it must be absolutely clean, and the nurse must keep in mind the fact that pasteurization does not completely destroy the bacterial growth in milk, that it merely diminishes it, and she must see that the milk which has undergone the pasteurizing process is kept cold, otherwise the microorganisms which are present, even if to a less extent than in raw milk, will undoubtedly multiply.

Adulteration of Milk.—There is not nearly so much adulteration of milk to-day as there was a few years ago. The stringent laws governing the care and composition of the milk make it unprofitable for the dairymen to practise it. However, there are times when such things are done and care must be taken to prevent it. Milk is, as has already been stated, very susceptible to contamination, and that which is infected with putrefactive bacteria is not fit for food even if the dealer has doctored it with formaldehyde. However, the danger to-day is not so much from drugs as from lack of care in the handling of the milk. It is well to remember, however, that water is an adulteration just the same as formaldehyde and perhaps more pernicious, since the quantities of the latter are so small in an ordinary quantity of milk as not to make a great deal of difference except in the feeding of invalids and children, while watered milk is a swindle not only to the pocketbook but to the body also, since the requisite nutritive value is lacking.

Selection and Care of Milk.—There are a few essential facts to keep in mind in regard to milk: (1) Be sure of the source of the milk supply, especially in the feeding of the sick and of infants. Milk for such cases should always be purchased from inspected dairies when it is possible. (2) Keep the milk cold; the best milk in the world will

MILK, METHOD OF PEPTONIZING

spoil if left in a warm place. (3) Always keep the milk bottle well covered, thus eliminating the danger of contamination, flies, etc.

Skimmed Milk.—Milk which has had the cream removed is still nutritious, but not so much so as whole milk. Babies fed upon skimmed milk will grow thin unless fat is added in some form.

Buttermilk is milk which has been soured, either naturally, by allowing it to stand in a warm place until it is soured and coagulated, or, by adding lactic acid bacteria (Bulgarian Culture) to bring about the souring and coagulation. Buttermilk may be made from whole or skimmed milk, but the latter is thin and watery and less palatable than that made from the milk with the cream left in. Buttermilk is one of the most wholesome forms in which milk can be taken, and for this reason is used largely in the invalid dietary and in the feeding of infants. Kumyss, Matzoon, and Zoolak are artificially fermented milk, and are used in the feeding of the sick.

Whey.—Whey is an opalescent solution which remains after the coagulation of casein; it contains the greater part of the lactose, lactalbumen, and ash constituents of milk. Whey being fat-free is used as a substitute for part or all of the diluents in the modification of milk for infants under certain conditions specified by the physician.

MILK, METHOD OF PEPTONIZING

Partially Peptonized Milk: To a bottle containing one pint of milk and 4 ounces of water, add one peptonizing powder. Keep the bottle at a temperature of 105° to 115° F. This is best done by placing the bottle in hot water of that temperature, for about 20 minutes to a half hour. The milk should then have a slightly bitter taste. Part of the proteins of the milk are digested by this method.

Completely Peptonized Milk: The method for complete peptonization is the same as for partial peptonization, but it is continued for two hours, during which time all the proteins are completely digested. Completely peptonized milk has an extremely bitter taste.

MINDERERUS, SPIRIT OF

See AMMONIUM.

MINERAL OIL

See LIQUID PETROLATUM.

MIOTICS

Miotics are drugs which cause the pupil of the eye to contract, such as *Pilocarpus* and *Eserine*.

MOSQUITOES

MISCARRIAGE

See ABORTION.

MIXTURES

Mixtures are preparations consisting of several drugs mixed together. Fluids containing a substance which does not dissolve are also called mixtures.

MONSELL'S SOLUTION

See IRON.

MORPHINE

The effects of morphine differ slightly from those of opium in the following ways:

1. Morphine is much more rapidly absorbed, and therefore acts more rapidly.
2. It can be given hypodermically.
3. It does not increase the secretion of sweat as much as opium.
4. It is not as consípating as opium. (See OPIUM.)

Preparations

Morphine; dose $\frac{1}{8}$ to $\frac{1}{2}$ of a grain.

Morphine Sulphate; dose $\frac{1}{8}$ to $\frac{1}{2}$ of a grain.

Morphine Hydrochloride; dose $\frac{1}{8}$ to $\frac{1}{2}$ of a grain.

Compound Morphine Powder (Tully's powder); dose 5 to 15 grains.

This contains morphine sulphate, licorice powder, and camphor.

MOSCHUS

See MUSK.

MOSQUITOES

Mosquitoes in the northern United States and Canada are more a nuisance than a danger, but where the malaria or yellow fever germs are found certain genera of mosquitoes are known to carry them to new human victims. These genera are, for malaria, *Anopheles*; and for yellow fever, *Stegomyia*. It is well to know the readily distinguishable physical characters of the former, at least, in all the four stages, egg, larva, pupa, adult.

The contrasts with *Culex*, the ordinary genus, are quite definite. *Culex* eggs occur up-ended, in rafts, looking much like a broad, flat, irregular bundle of very small cigars, floating so that each cigar is vertical. *Anopheles* eggs tend to float each one by itself horizontally, instead of in rafts and vertically.

The larvæ ("wigglers") of the *Culex* at rest, like the

MOSQUITOES

Culex eggs, take a more or less vertical position, hanging from the surface of the water, head downward, their breathing tubes, which come from the tail end, thrust out to get the air. The *Anopheles* larvæ breathe similarly but lie along the surface, horizontally.

The differences between the pupæ are not so striking, but the adult *Culex* appears grayish, and humpbacked, while the *Anopheles maculipennis* appears black and carries its body in a straight line with its proboscis. Only the female "bites" in any genus; apparently blood is necessary to egg-laying. Both *Anopheles* and *Stegomyia* are harmless unless they become infected, the first with malaria by biting a patient in whom the malaria germs are circulating, the second by biting a patient in whom the (hypothetical) yellow fever germs are circulating. Both are harmless even then for 8 to 12 days, during which the malaria germ is known to be, and the yellow fever germ is believed to be, undergoing various changes which end with the presence of the germ in the salivary glands of the mosquito. After this stage is reached, the disease germs may be transmitted in biting. So far, no other method of transmission (except direct transfer of blood from patient to prospective patient) is known for either disease.

Two methods are employed for getting rid of these mosquito-borne diseases; one consists in preventing the mosquitoes from biting infected persons, thus keeping the mosquitoes uninfected, and therefore harmless; the other consists in preventing the breeding of mosquitoes and destroying those already in existence.

Mosquitoes need water, protected water, in which to breed. Rain barrels, cisterns, quiet, shallow, fish-less pools, etc., are necessary. If wind or wave or bird or fish can reach the eggs, larvæ or pupæ, their chances are small of reaching the adult's stage. Again, larvæ and pupæ must breathe while in the water, and by covering the water with a film of oil, they are prevented from reaching the air with their breathing tubes.

To get rid of mosquitoes is much simpler than to get rid of flies. Drainage of swamps or pools, covering with oil such as cannot be drained away, placing fish in ornamental waters which it is wished to retain, at the same time clearing the edges of reeds and weeds that might protect the larvæ from bird or fish, destroying old cans which lie about half-filled with rain water, clearing eaves where rain water may rest, and such like measures, will soon reduce or totally abolish them. Rain barrels or cisterns may be made mosquito proof by a layer of oil, the water being drawn off as required from below the oil.

MOUTH AND TEETH

MOUTH AND TEETH, CARE OF

Mouth hygiene, the sanitary mouth, or the care of the mouth and teeth is said to have ushered in a new era in preventive medicine. It is one of the main points of attack in preventing or curing disease, and in the preservation of health.

Importance of the Care of the Mouth.—The mouth is an ideal incubator for germs, as it contains food, air, moisture, and warmth. Even in healthy mouths bacteria are probably always present, while in neglected mouths they are abundant and multiply rapidly.

The Effect of Acids on the Teeth.—Acids destroy the enamel and the pulp of the teeth and allow the invasion of bacteria which cause abscesses at the roots of the teeth and pyorrhœa alveolaris. Devitalized teeth are very prone to infection at the roots. The presence of bridgework and plates, etc., makes the mouth difficult to keep sanitary and gives rise to infection.

The Effect of a Neglected Mouth on Digestion.—A neglected mouth spoils the appetite and decayed teeth interfere with mastication. The pus from abscesses, and the acids and bacteria swallowed interfere with digestion. The bacteria cause fermentation in the stomach and intestines with the formation of gases.

The Effect of a Neglected Mouth on Other Parts of the Body and the General Health.—Infection may spread to the sinuses, to the eyes, up the Eustachian tubes, to the ears, to the tonsils, to the salivary glands, and the cervical glands. From diseased tonsils, rheumatism, endocarditis, and chorea may develop. Infection and abscesses at the roots of teeth are associated with arthritis, nephritis, gastric ulcer, appendicitis, endocarditis and other serious diseases. From a neglected mouth in typhoid a patient may reinfect himself. A neglected mouth is a menace to the entire system.

The kind of patients apt to develop bad mouths, who therefore require special care, are: (1) Unconscious or dying patients; (2) patients suffering from fevers, such as typhoid and pneumonia, in which the lips, tongue, and membranes of the mouth become dry and cracked. Food, milk, dried epithelial tissue and bacteria get into the cracks, forming thick tenacious deposits called sordes, very difficult to remove. If not kept clean, very painful ulcers on the tongue and cheek, tympanites, and infection of the ears or glands result; (3) in many diseases, in almost all forms of illness, and in all very ill patients, especially those on liquid diet, the tongue becomes furred.

General Care of the Mouth.—It should be kept clean and moist, and cleansed with an antiseptic solution frequently.

MOUTH, PRE-OPERATIVE CARE OF

Mouth breathing, and any mechanical or chemical injury to the gums with tooth brushes, pastes, or medicines must be avoided.

The Daily Routine Care.—The mouths of convalescent patients should be cleansed three times a day, or at least in the morning and evening. Very ill patients, patients with a high fever, or those with difficult breathing who breathe through the mouth, should have their lips and mouths cleansed more frequently: they should be cleansed before fluids, and the mouth should be well rinsed after fluids. The tongue should not be cleansed directly after fluids, as it may induce gagging. Special care should be taken in rinsing and cleansing the mouth after milk. The patient should be given water to drink freely, in order to supply the tissues with fluid and keep the mucous membrane of the mouth moist and clean. For all sick patients moisten the lips and tongue frequently.

Mouth Washes Commonly Used.—For *general purposes* the following solutions are satisfactory: Listerine and water, equal parts; Glycothymolin, one-third strength; Boric acid solution; Dobell's solution, one part in three parts of water or Dobell's solution and Listerine, equal parts; Lemon juice and glycerin, equal parts or one dram of lemon juice in three drams of glycerin.

To *cleanse the mouth of a very sick patient*, remove one pillow and turn the patient's head toward you. Protect the patient and the bed by placing a towel under the chin across the chest. Open the mouth and examine it before and during the procedure. Cleanse all parts thoroughly but use the greatest caution not to break or injure the mucous membrane, as this makes it more liable to infection. Cleanse with the solution or paste on the patient's tooth brush or on gauze wrapped carefully around a tongue depressor or whalebone; use each piece of gauze only once. Avoid making the patient gag; avoid touching the back of the throat. Use a swab (cotton on a tooth pick) for removing particles between the teeth. Allow the patient (if strong enough) to rinse his mouth after cleansing, first with an antiseptic mouth wash, then with water. When the tongue is parched and dry, apply liquid albolene to the tongue with a medicine dropper after cleansing.

MOUTH, PRE-OPERATIVE CARE OF

The Mouth is of special interest because it comprises part of the operative field of the upper and lower jaws, and the tongue; it is the path through which the tonsils and the adenoids are approached; and the means by which the trachea and esophagus are entered. Its main importance from

MUMPS

a surgical standpoint is that it can never be rendered sterile, so that all the operations on the afore-mentioned organs must of necessity be contaminated. Even though the work is done in a contaminated field, the same aseptic surgery should be practised here as is practised in other regions.

This fact should not deter the nurse from getting the mouth as clean as possible for the operation. It is usual to have the patient wash the buccal cavity every two hours with some liquid, either warm saline, or water to which has been added one of the countless pleasant-tasting antiseptics which are in every-day use. This should be begun about two days prior to the operation. It is imperative that mouth washing should be done thoroughly. The nurse should not content herself by simply informing the patient that the mouth is to be washed, but she should stand by and see that it is efficiently done. In addition, the teeth should be carefully brushed at least after each meal. If pyorrhea exists, the teeth should be scraped and the gums treated by a dentist. In this way the amount of mouth contamination may be reduced to the minimum.

MOUTH-WASHES

See GARGLES.

MUCILAGES

Mucilages are gummy drugs dissolved in water.

MUMPS (EPIDEMIC PAROTITIS)

The cause is not yet discovered. The disease is characterized by swelling of the parotid gland and difficulty in opening the mouth. There is redness and swelling of the opening of Stenson's duct, accompanied by considerable pain; hyper-pyrexia is often present. The chief complications are orchitis in the male and swollen, painful breast in the female. The incubation period is from fourteen to twenty-one days. Isolation should be insisted on for three weeks, though some doctors claim the disease is not contagious after the swelling disappears.

The nursing care in general is isolation. Plenty of fluid and soft solid food (avoiding acids) must be given during the acute stage. Isolation and attention to the diet are the chief requirements, in addition to the usual care given to any bed patient. The complications are treated with either external heat or cold according to the amount of inflammation present. In mild cases convalescence is established in a short time, but in the more severe type the patient requires continued care.

See INFECTIOUS DISEASES, COURSE OF.

MURPHY BUTTON

MURPHY BUTTON

See INTESTINES, SURGICAL CONDITIONS OF.

MURPHY METHOD

See RECTUM, ADMINISTRATION OF MEDICINE BY.

MUSK (MOSCHUS)

Musk is the dried secretion of the glands situated in front of the prepuce of the *Moschus moschiferus*, or the musk deer of Thibet. It is a dark brown substance, with a very strong characteristic odor. Owing to the difficulty of obtaining a reliable preparation, musk often produces no effects. If the preparation is a good one, it produces the following effects:

1. It relieves nervousness and calms and quiets the patient.

2. It is said to make the pulse stronger and faster.

3. It often relieves hiccough.

Large doses have occasionally caused headache, dizziness, confusion, and muscular twitchings, followed by sleep. It is used as an antispasmodic, and occasionally as a heart stimulant. The effects wear off very quickly.

Preparations

Musk; dose 8 to 15 grains.

Tincture of Musk; dose 1 to 2 drams.

MYDRIATICS

Mydriatics are drugs which cause the pupil of the eye to dilate; such as Atropine, Belladonna.

MYOPIA

See ACCOMMODATION.

MYRINGOTOMY

See EAR NURSING.

MYRRH

Myrrh is a gum resin obtained from the *Commiphora Myrrha*, an American tree. It contracts skin and mucous membranes and is slightly disinfectant. It increases the secretions and is said to increase menstruation. It is used principally as an astringent; in inflammations of the gums, as in mercury poisoning, and as an ingredient of many cathartics.

Tincture of Myrrh; dose 30 to 60 minims.

MYXEDEMA

See THYROID GLAND, DISEASES OF.

N

NAPHTHALENE

Naphthalene is a substance obtained from coal tar.

Applied to the skin or mucous membranes it checks the growth of bacteria. **When given internally**, it checks the growth of bacteria in the intestines, thereby relieving the formation of gas. A little of the naphthalene is absorbed into the blood, and this is eliminated by the lungs. Here it increases the secretion of the mucous membrane and also acts as an antiseptic. Most of it is excreted by the feces.

Large doses cause symptoms like those of carbolic acid poisoning.

Naphthalene is used principally as an intestinal antiseptic for tape worms; to increase coughing, and as an antiseptic for abscesses in the lungs.

Preparations

Naphthalene; dose 1 to 5 grains.

Betanaphthol (Naphthol); dose 3 to 10 grains.

Betanaphthol Benzoate; dose 3 to 8 grains.

This forms benzoic acid and naphthol in the intestines.

Betol (Naphtholis Salicylas); dose 5 to 8 grains.

This forms salol and naphthol in the intestines.

All these preparations should be given in keratin coated pills so that they will be dissolved only by the alkaline juices in the intestines.

NAPHTHOL

See NAPHTHALENE.

NARCOTICS

See HYPNOTICS.

NASAL GAVAGE

See GAVAGE.

NAUHEIM OR EFFERVESCENT BATH

"This consists of a full bath the water of which contains chloride of calcium, carbonate of soda, and carbonic acid gas." It is an artificially prepared bath used as a sub-

NAUSEA (POST-OPERATIVE)

stitute for the natural mineral water of the famous resort of Nauheim, Germany.

The effects are the same and depend upon the proportion of chemical substances used.

Composition of the Bath.—The following ingredients are put up in powder form so that one, two or three powders may be used according to the intensity of the effect desired.

Sodium carbonate	1½	pounds
“ bicarbonate	½	“
Calcium chloride	3	“
Sodium chloride	2	“
“ bisulphate	1	“

Effects of the Bath.—These chemical irritants added to the neutral bath produce a powerful circulatory reaction—that is, dilatation of the cutaneous blood vessels, with contraction of the adjoining and associated visceral vessels—without provoking a thermic reaction. The disadvantages of using extremes of temperature, in certain cases, may thus be avoided.

The *bath is used* in cardiac and renal diseases where extremes of temperature are undesirable or dangerous.

Method of Procedure.—The tub should be lined with rubber to prevent injury to it due to the chemical ingredients.

The Nauheim baths are very exhausting and therefore only to be used with the greatest caution. If dyspnea is present the patient must not enter the bath; the breathing must be quiet and tranquil. The chest should be wet before entering, and the limbs well rubbed during the bath. No exertion must be allowed either during or after the bath.

The baths are carefully graded to suit the patient as regards the strength of the ingredients used, the temperature and the duration of the bath. They should begin with the mildest ingredients, at 95° F., should last only two or three minutes, and should be given only every other day. Even the strongest must not take more than three baths in succession without a day's interval.

The patient must not be allowed to become chilled before, during or after the bath. After the bath the patient should be wrapped in a hot sheet, and given friction until dry. He should then be allowed to rest for an hour or two.

NAUSEA (POST-OPERATIVE)

Nausea is usually present after all operations for a short time. Some doctors are in the habit of ordering cracked ice to relieve this distressing symptom. Whenever it is ordered, care must be taken lest the patient get too much and in

NEOSALVARSAN

this way imbibe large quantities of cold water with the result that vomiting occurs. When the feeling of nausea becomes very severe it is accompanied by vomiting. If a patient vomits later than twenty-four hours after operation, there probably is something in the stomach which is causing a persistent irritation. Once this irritation is removed, the vomiting will generally cease. It must be remembered that the patient has just been operated upon, and that the nerves are exhausted, and that conservative treatment is better than radical. The most effective procedure for ridding the stomach of foreign material is gastric lavage; but washing the stomach is trying and tiring and should only be employed when other simpler methods have proven unsuccessful. First the following should be tried: A glassful or approximately eight ounces of lukewarm water with about a teaspoonful of sodium bicarbonate should be administered by mouth. As a rule, patients are very thirsty after operation, and greedily drink the proffered water. The result is that they are further nauseated and soon vomit the ingested water, thus washing out the stomach, and instant relief often ensues. Sometimes, in spite of these measures, vomiting will still persist. It is due then to atony, a relaxation of the muscles of the stomach wall. Persistent vomiting is very weakening, and gastric lavage should be given almost immediately, if the sodium bicarbonate and water fail to afford relief. A post-operative lavage must be of hot water, for the heat itself is the efficient agent in stimulating the stomach walls to contract, and therefore the water should be introduced at about 108-110 degrees Fahrenheit. Another point,—as little air as possible should enter the stomach tube, and when the lavage is finished, the water should be carefully siphoned off from the stomach. If the vomiting persists after a good gastric lavage, it then may be due either to pernicious vomiting, or possibly, gastric dilatation.

NEGATIVISM

Negativism is the tendency to respond to a stimulus in a way which is the reverse of the usual reaction. If a patient is told to put his tongue out, he does the exact opposite, shuts his lips tightly to keep his tongue in his mouth. Negativism may also be shown by resisting baths and treatment, the taking of food, exercise, etc., and may be caused by illusions and hallucinations in which voices tell him not to act, or that the food is unfit to eat, etc.

NEOSALVARSAN

See ARSENIC; and SALVARSAN.

NEPHRECTOMY

NEPHRECTOMY

See KIDNEYS, SURGICAL CONDITIONS OF.

NEPHRITIS

Nephritis means *inflammation* of the kidney. *Complete rest* is the first essential in the treatment of inflammation. This can only be provided by lessening the work of the diseased organ. The work can only be lessened by regulation of the diet, by lessening the wastes from tissue metabolism, by preventing infections, avoiding the use of irritating drugs, and by stimulating elimination through the skin and intestines.

The Nursing Care and Treatment.—*Rest* in bed is essential. All unnecessary exertion is to be avoided. The patient may not even be allowed to sit up, because all forms of exercise mean increased metabolism and tissue wastes to be eliminated and the ashes formed are very irritating to the kidneys. For this reason all causes of discomfort and restlessness are particularly to be avoided.

The Diet.—Rest of the kidneys is only possible through a carefully regulated diet. It is usually restricted in amount and very carefully selected. All foods which irritate or are eliminated with difficulty or whose ashes increase the work of the kidney are to be avoided. Starvation is also avoided as it results in destruction of muscle and other body tissues, the ashes of which are irritating and increase the work of the kidneys. *Protein* is restricted to an amount barely to meet the body needs. Salt may also be restricted to either a "salt-poor" or "salt-free" diet. Salts are restricted particularly in edema. Sometimes milk alone is given because it is low in sodium chloride. It contains sugar and fat (cream may be added) and sufficient protein to meet the body needs may be given in this way. *Fruits* contain very little salt, so are freely given. *Sugar* and *fats* leave little waste for the kidney to eliminate. They increase the caloric value and prevent tissue destruction, so are usually allowed. *Foods which irritate*, such as celery, onions, radishes, garlic and condiments, are to be avoided. *Meat* extracts and broths are also avoided. They have little nutritive value and contain sodium chloride, pigments, creatinin, etc., irritating to the kidneys.

Fluids.—When the kidneys are able to eliminate and the patient is not edematous, fluids are usually forced, to dilute the waste products, flush them from the system, and lessen irritation of the kidneys. Water, lemonade, orangeade, and imperial drink are given by mouth. Water is also given by rectum by means of colon irrigations or the Murphy drip. Where the patient is edematous, and in anuria, showing

NEURONAL

the kidneys to be impermeable to water, fluids are restricted and elimination through other channels is encouraged. *Thirst* which usually results may be relieved by ice or water in small amounts. The care of the mouth is very important. The amount of fluid, or the "intake," should be carefully measured.

The *condition of the skin* is of vital importance. We rely on the skin to save the kidneys. It must be kept warm and its circulation and functions stimulated. Rest in bed between blankets, daily cleansing baths and massage aid greatly. Chilling must be avoided. All exposure to cold air or water is to be avoided. Fresh air without exposure is desirable. The care of the skin is also important because of the danger of bedsores.

The Body Eliminations.—To rest the kidneys, elimination through all other channels is stimulated. When water is allowed fluids are forced to stimulate perspiration. Hot fluids are good. Hot baths, hot packs, and drugs (diaphoretics) are used for the same purpose. Sweating is stimulated, particularly when there is edema. With a good sweat it is said that one quart of water and fifteen grains or more each of urea and sodium chloride may be eliminated. When the blood-pressure is high with arteriosclerosis and a hypertrophied heart extreme care must be taken in giving hot packs because of their depressing effect on the heart and nervous system, etc.

The *bowels* are kept open and stimulated by the use of cathartics which cause watery movements, especially with edema.

The Avoidance of Infection.—Infections such as colds, tonsillitis, ulcerated teeth, and all other infectious diseases should be avoided. When the kidneys are diseased their resistance is lowered so that they are very susceptible to infection by germs as they are being eliminated.

NEPHROLITHOTOMY

See KIDNEYS, SURGICAL CONDITIONS OF.

NEPHROTOMY

See KIDNEYS, SURGICAL CONDITIONS OF.

NEURASTHENIA

See PSYCHONEUROSES.

NEURONAL

Neuronal is a white crystalline substance having a bitter taste and odor resembling menthol. It produces sleep.

NEUROSES OF STOMACH

Its effects resemble those of veronal, and it is given in the same way. Dose, 5 to 30 grains.

NEUROSES OF STOMACH

See STOMACH.

NIPPLES, CRACKED OR FISSURED

Abrasion or fissure of the nipple is a fertile source of pain and inflammation. It may usually be prevented by care. The nipples should be hardened during pregnancy. (In the last week or two the skin of the nipples may be bathed twice a week with eau de Cologne and water (1 to 3), and on the other days gently massaged with lanoline or white vaseline. This tends to toughen the skin.) Each time the child is put to the breast the nipple should be washed over with sterilized water, and after the child is finished, with weak boracic lotion. An occasional sponge with spirit and water is also helpful in preventing the skin from becoming sodden. When the patient is up and dressed, the nipples should be protected by a clean, soft dressing of linen or cotton wool.

If cracks form they must be kept scrupulously clean. A little dressing with boracic lotion may be applied, or a paint of Friar's balsam, or glycerite of tannic acid. Playfair's mixture, containing half an ounce of sulphurous acid, half an ounce of glycerite of tannic acid, and an ounce of water, is a most useful one. In all cases of fissure the nipple should at the same time be protected during suckling by a nipple shield. It is important to remember that a fissure of the nipple may bleed during suckling, and the child may swallow the blood. This it generally vomits later, to the great alarm of the mother and nurse.

NITER, SWEET SPIRITS OF

See NITRITES.

NITRATES

The nitrates are salts formed by the combination of nitric acid and an alkali.

The nitrates are very cooling, and increase the flow of urine, and occasionally the secretion of sweat.

Poisonous Effects

Overdoses of the nitrates often cause the following symptoms.

1. Burning pain in the throat, and in the abdomen.
2. Nausea and vomiting; the vomited matter often contains blood.
3. Diarrhea, with bloody stools.

NITRITES

4. Profuse secretion of urine, or scanty urine.
5. Great muscular weakness.
6. Collapse, coma and death.

Preparations

Potassium Nitrate (Saltpeter); dose 5 to 30 grains.

This preparation is the one which is commonly used.

Sodium Nitrate; dose 5 to 30 grains.

NITRIC ACID (AQUA FORTIS)

Nitric acid acts like other acids, except that it is said to increase intestinal secretions and the secretion of bile. It is occasionally used instead of hydrochloric acid to aid digestion. A drop of the strong acid is frequently applied on the skin to destroy an infected area.

Dilute Nitric Acid; dose 10 to 30 minims.

This contains 10 per cent. of nitric acid.

For Local Use: Nitric Acid.

This contains 68 per cent. of nitric acid.

See ACIDS, INORGANIC.

NITRITES

AMYL NITRITE

Amyl nitrite is a yellow fluid which evaporates easily, and has a characteristic odor of fruit.

About three to five minutes after an average dose of amyl nitrite is inhaled, the face becomes flushed, and sometimes the skin all over the body as well. The patient complains of fullness and throbbing in the head, and often of severe headache. The pulse is rapid, soft and bounding, and the breathing is rapid and somewhat deeper. These symptoms last for about ten to fifteen minutes, and then pass off.

Administration

Amyl nitrite is usually given by inhalation. It comes in small glass "pearls," each containing about 3 to 5 minims of amyl nitrite, which are broken in a handkerchief and then applied to the nose of the patient. The handkerchief should be withdrawn as soon as the effects are produced. Amyl nitrite is occasionally given hypodermically. It is also given by the mouth; about 3 to 5 minims dropped on a piece of sugar; but the effects then appear very slowly.

Uses

Amyl nitrite is used for the following effects:

1. To relieve an attack of "angina pectoris," a disease characterized by attacks of severe pain around the heart, and shooting pains into the left arm.
2. To relieve an attack of bronchial asthma.

NITRITES

ACTION OF THE NITRITES

Appearance of the Patient

The effects that result from the use of the nitrites are the same as those following amyl nitrite, but they appear very slowly. All the nitrites with the exception of nitroglycerin, may cause nausea and vomiting.

Action after Absorption

The nitrites are very rapidly absorbed into the blood, through the lining membrane of the stomach. After absorption, they affect principally the blood vessels, the respiration and the kidneys.

Action on the blood vessels: The nitrites affect principally the blood vessels. They paralyze the small involuntary muscle fibers in the walls of the small blood vessels. As a result, these blood vessels are widened, so that it is easier for the blood to pass through them, and the blood pressure is lessened. The heart contracts faster, however, because the wider blood vessels offer very little resistance to the contractions of the heart, which then contracts with greater ease. By the action on the blood vessels, the nitrites ease the action of the heart, when it is overworking because of increased blood pressure, or because of spasmodic contractions of the blood vessels.

The blood vessels of the abdomen and head are more affected than those of the extremities.

The total effect of the nitrites on the circulation is to **make the heart beat faster, and to lower the blood pressure.** Consequently the pulse is rapid, soft and bounding.

Action on the respiration: The nitrites make the breathing faster and deeper.

Action on the kidneys: The flow of urine is often increased by the nitrites, when the kidneys do not secrete a sufficient amount of urine, because of the high blood pressure. The better circulation of blood in the kidneys as a result of the widened blood vessels, increases the secretion of urine.

Excretion

The nitrites are excreted by the urine, usually in about one or two hours.

Poisonous Effects

Poisonous symptoms usually occur suddenly from the inhalation of an overdose of amyl nitrite. After prolonged administration of the other nitrites the same symptoms occur, but more gradually.

Symptoms.—1. Flushing of the face and neck.

2. Intense, throbbing headache (a feeling of a tight band around the head or as if the "head were coming off").

NITRITES

These symptoms frequently occur from an ordinary dose of amyl nitrite, but soon pass off. Occasionally from a single dose of amyl nitrite, and from continued use of other nitrites the following symptoms may also occur:

3. Faintness.
4. Dizziness.
5. Dilated pupils.
6. Slow, irregular pulse.
7. Confusion of ideas.
8. Collapse.

The symptoms usually improve when the patient is lying down or when the drug is stopped.

Administration

The nitrites should be given in a wineglassful of milk after meals. If tablets are used these should be dissolved in the milk.

Uses

The nitrites are given principally in repeated doses for a long time, in the following conditions:

1. **Arteriosclerosis**, or hardening of the arteries.

It relaxes the contractions of the arteries whose muscle fibers have not yet been replaced by connective tissue. In many cases nitroglycerin produces no effect, as the muscle fibers have been replaced by fibrous tissue, which is not elastic.

2. To reduce blood pressure, in nephritis.

3. To relax the contractions of the involuntary muscles in the bronchi, in asthma.

4. To prevent the attacks of angina pectoris by keeping the muscles of the coronary blood vessels of the heart relaxed.

NITROGLYCERIN

Nitroglycerin or spirits of glonoin, is a colorless, oily liquid which has an odor and taste like alcohol. Preparations of nitroglycerin should be very carefully handled, as it is apt to explode when dropped on the floor, when heated, or when rubbed vigorously. If it is accidentally spilled, it should be destroyed immediately, by pouring potassium hydroxide solution over it.

A 1 per cent. alcoholic solution is used as a medicine, which should always be kept cool, as it may explode when exposed to heat.

Preparations

Spirits of Glyceryl Trinitrate (Nitroglycerin or Spirits of Glonoin); dose $\frac{1}{2}$ to 3 minims.

This is a 1 per cent. alcoholic solution of nitroglycerin. It should always be fresh, as it decomposes very easily.

NITRITES

Tablets of Nitroglycerin; each containing $\frac{1}{100}$ of a grain. 1 to 2 tablets are given at a time.

These are not as efficient as a solution of the drug, and they decompose very easily.

SODIUM AND POTASSIUM NITRITES

They produce the same effects as amyl nitrite or nitroglycerin, with the following variations:

1. Their effects appear very slowly, usually in about a half hour, but they last for several hours.
2. They often cause nausea, belching of gas, and pain in the stomach, and occasionally diarrhea.
3. They do not cause as much headache or flushing of the face as amyl nitrite or nitroglycerin does.

Uses

The nitrite of either sodium or potassium is suitable for continued use, to lower the blood pressure.

Preparations

Sodium Nitrite; dose 1 to 2 grains.

This is given in solution or in tablets.

Potassium Nitrite; dose 1 to 2 grains.

These preparations produce the same effects as nitroglycerin, but the effects appear more gradually and are more lasting. The effects usually appear in about 15 minutes and last for about 3 or 4 hours.

SWEET SPIRIT OF NITER (SPIRITUS ÆTHERIS NITROSI)

Sweet spirit of niter is a 4 per cent. solution of nitrous ether, or ethyl nitrite, in alcohol. It evaporates very easily and is inflammable. It should always be fresh, as old solutions decompose.

Sweet spirit of niter produces the same effects as nitroglycerin or the other nitrites.

It dilates the blood vessels by paralyzing their muscle fibers, and causes:

1. A rapid, soft, bounding pulse.
2. Rapid breathing.
3. Increased flow of urine, by relaxing the blood vessels of the kidneys.
4. Increased secretion of sweat, by widening the blood vessels of the skin, so that the sweat glands are supplied with more blood from which to secrete perspiration.

Poisonous Effects

Inhalation of sweet spirit of niter has produced dangerous, even fatal symptoms, resembling those produced by amyl nitrite.

Symptoms.—1. Headache.

NOSE

2. Pain around the heart.
3. Weak, slow pulse.
4. Slow, shallow breathing.
5. Muscular weakness.
6. Collapse.

Uses

Sweet spirit of niter is used to increase the sweat and thereby to reduce fever, especially in children. It is given in small doses, well diluted; and the patient should be kept in bed, warmly covered. If the skin is kept cool, it increases the flow of urine.

Preparation

Spirit of Nitrous Ether (Sweet Spirit of Niter); dose 15 to 60 minims.

NITROGLYCERIN

See NITRITES.

NITROHYDROCHLORIC ACID

Nitrohydrochloric acid or *aqua regia*, is a mixture of one part of nitric and 4 parts of hydrochloric acid. It is the most powerful acid, and the only fluid which will dissolve platinum and gold.

This acid diluted is principally used to increase the flow of bile, given in the following ways:

1. By mouth, sipped through a glass tube.
2. In a foot bath or ordinary bath.
3. It is said to be more efficient if it is applied to the liver in the form of a stupe, about 1 to 2 drams of the dilute acid being used to a pint of water.

Preparation

Dilute Nitrohydrochloric Acid; dose 5 to 15 minims.

This contains 40 parts of nitric acid and 180 parts of hydrochloric acid in 1000 c.c. of water.

See ACIDS, INORGANIC.

NITROUS OXIDE

e ANESTHETICS

NOSE

The nose is the special organ of the sense of smell, but it also serves as a passageway for the entrance of air to the respiratory organs. It consists of two parts—the external feature, the nose, and the internal cavities, the nasal fossæ.

The external nose is composed of a triangular framework

NOSE

of bone and cartilage, covered by skin and lined by mucous membrane. On its under surface are two oval-shaped openings—the nostrils, which are the external openings of the nasal fossæ. The margins of the nostrils are provided with a number of stiff hairs, which arrest the passage of dust and other foreign substances which might otherwise be carried in with the inspired air.

The nasal fossæ are two irregularly wedge-shaped cavities, separated from one another by a partition, or septum. The septum is formed partly by the vertical plate of the ethmoid, partly by the vomer, and partly by cartilage.

The nose serves the very important function of filtering, warming, and moistening the air. In addition to aiding the sense of smell, it also gives the voice some of its qualities.

Deviated Septum.—In this condition one or both sides of the nose are occluded by a deformity of the nasal septum, and an attempt is made to remove the obstructing cartilage by a submucous resection preserving the mucous membrane of the septum. After the operation has been completed, each nasal cavity is packed with strips of sterile gauze. The packing is removed after twenty-four hours.

Hypertrophy of the Turbinates.—The turbinates are small bones, three in number, found along the outer wall of each nasal cavity. Occasionally these increase in size and obstruct free respiration. They may be reduced by chemical irritants, cautery, or partially removed by cutting them with a wire snare. Occasionally, hemorrhage may follow the removal of part of the turbinate bones. This may be controlled by spraying in some adrenalin solution, syringing the nose with hot water (temperature about 120° F., or plugging the nose with cotton. Most of these operations are done under novocaine.

Sinusitis.—The sinuses of the nose may be frequently involved during a cold, and very often the frontal, ethmoidal, sphenoidal sinuses or the antrum may be the seat of infection. This condition is recognized by pain in the region of the sinus involved, discharge, and tenderness on pressure over the sinus. The treatment consists in establishing free drainage. In the case of the antrum of Highmore, this is done by puncture of the sinus and daily irrigations through the nose.

Foreign body in the Nose.—Make pressure on the opposite nostril and have patient take a deep breath **through the mouth** and then close it. Thus the air may force the obstacle out. Or, while pressing on the opposite nostril, blow the nose hard or induce sneezing by tickling the inside of the nostril, or having a little pepper in the air.

NUX VOMICA

NOSE-BLEED

See **EPISTAXIS**.

NOVASPIRIN

See **SALICYLIC ACID**.

NOVATOPHAN

See **ATOPHAN**.

NOVOCAINE

Novocaine is an artificial alkaloid which is used as a local anesthetic. It acts like cocaine, but it is less poisonous and its effects wear off quickly. It is usually given together with epinephrin.

Preparations

Novocaine Tablets. Each tablet contains $\frac{1}{3}$ to 3 grains. There are also tablets containing novocaine and adrenalin.

Novocaine Nitrate; dose $\frac{1}{3}$ to 3 grains.

It is usually used in a 3 per cent. solution.

See **COCAINE**.

NUTGALL

Nutgall is a growth which forms on the bark of the gall oak tree, by the punctures and the deposited eggs of a species of fly. Before the larvæ are formed from the ova, the galls contain about 50 per cent. of tannic acid and smaller quantities of gallic acid.

Nutgall contracts the tissues and checks the secretion of mucous membranes because of the tannic acid which it contains. It is little used except in the form of an ointment, as a local application for hemorrhoids.

Preparations

Tincture of Nutgall; dose one-half to three drams.

Nutgall Ointment.

Gall and Opium Ointment.

This contains $7\frac{1}{2}$ per cent. of opium.

NUX VOMICA AND STRYCHNINE

Nux vomica is obtained from the seeds of the **Strychnos nux vomica**, and **Strychnos ignatia**.

The active principles are two alkaloids: **strychnine** and **brucine**. The effects of both are the same; brucine being half as strong as strychnine.

The action of nux vomica is due to the strychnine which it contains, so that the effects of the drug are the same as those of its active principle.

Internal Action: In the mouth: Strychnine has a very bitter taste; it increases the appetite and the flow of saliva.

NUX VOMICA

In the stomach: Strychnine increases the secretion of gastric juice, and the peristalsis of the muscle wall of the stomach.

In the intestines: It increases the secretion of the mucous membranes and the peristalsis. Frequent movements of the bowels then result.

Action after Absorption.—Strychnine is absorbed into the blood mainly from the intestines, in about one or two hours. After absorption, it affects principally the circulation, the respiration, and the spinal cord.

The effect of strychnine on the circulation is to **make the heart beat slower and stronger**. The characteristic **strychnine pulse is slow and strong**.

Action on the respiration: The breathing is deeper and faster.

Action on the nervous system: Strychnine increases the appreciation of all the various sensations; thus pain is felt more keenly, and all the senses become more acute.

Reflex action and all the activities of the body which are affected by impulses received through the various sensory nerves are increased.

In this way, strychnine acts as a tonic, improving the activity of every part of the body. The patient responds better and more readily to all the impressions received through the various senses. After continued strychnine administration the individual is therefore able to do more work. The appetite and digestion are better, and the bowels move more often, because of the increased reflex action which makes the gastric and intestinal muscles respond more easily to any substance affecting their mucous membranes. The heart beats stronger, and the breathing is more rapid and deeper. As a result of all these effects on the various organs of the body, the patient feels stronger, healthier, and his general condition is improved.

Poisonous Effects

Strychnine poisoning occurs in two forms: acute poisoning and cumulative poisoning.

Acute Strychnine Poisoning

Acute strychnine poisoning usually results from an overdose of strychnine, or when a preparation of the drug is taken with suicidal intent. The symptoms appear very soon after it is taken, usually in about fifteen minutes.

Symptoms.—1. The patient complains first of **stiffness of the muscles** of the neck or face, and of slight stiffness of the jaw; soon there follows **twitching of the face or arms**.

2. **Sudden tetanic convulsions of the whole body then**

NUX VOMICA

Occur. The arms and legs are rigid and extended. The head is drawn back, and the back is bent so that it forms a concavity (opisthotonus). The contractions of the facial muscles draw up the corners of the mouth, causing a peculiar grin and ghastly expression known as the "risus sardonius."

The convulsions are due to the increased reflex action, and are brought on by the slightest stimulus, such as a gust of air, the touch of a blanket, a flash of light or the slam of a door. After the convulsion, all the muscles are relaxed and there is a feeling of soreness, but the slightest touch, a gust of wind, or a loud noise, at once produces another paroxysm.

3. The contractions of the muscles of the diaphragm, during the convulsions, give the **face and lips a blue color**, from the lack of oxygen in the blood, due to the interference with the breathing.

4. **The pulse is slow and stronger**, but during the convulsions it is often rapid and weak.

5. The convulsions become more frequent and often clonic in character, and the patient finally dies of asphyxia, in about two or three hours, the mind remaining clear to the end.

Treatment.—1. Give tannic acid or tea to combine with the strychnine.

2. Wash out the stomach or give emetics (but not during the convulsions) if strychnine has been taken by the mouth.

3. If the patient has convulsions, give ether to control them, and then wash out the stomach.

4. To prevent the convulsions from returning, chloral or bromides are given repeatedly.

5. Catheterize; to prevent reabsorption of the strychnine from the urine.

6. Give artificial respiration and oxygen when the patient is blue and cyanotic.

Cumulative Strychnine Poisoning

Since strychnine is rapidly absorbed and very slowly excreted, some of it always remains in the body when it is given continuously, and often causes cumulative symptoms. These symptoms, which result from the accumulation of strychnine in the body, are the same as the acute symptoms, but they develop more slowly.

Symptoms.—1. The earliest symptoms which indicate that the patient is getting too much strychnine, are **twitching of the muscles of the face** or of the **extremities**, such as shrugging of the shoulder or twitching of the fingers.

2. Often the earliest symptom may be **diarrhea**.

NUX VOMICA

3. Soon the patient complains of stiffness of the neck and jaw or in the muscles of the face.

If the drug is continued, convulsions may occur.

Treatment.—Stop the drug as soon as the earliest symptoms are noticed. This enables the strychnine in the body to be eliminated, and further symptoms are avoided. If other symptoms occur, the treatment is the same as for acute poisoning.

Uses

Strychnine is used principally for the following effects:

1. As a heart and respiratory stimulant in collapse.
2. In various forms of paralysis, to increase the contractions of the muscles.
3. As a tonic, to improve the general health and strength of the body.
4. To increase the appetite and to improve the action of the bowels.

Administration

For rapid effect in collapse, strychnine should be given hypodermically.

To increase the appetite, nux vomica is usually given before meals, undiluted.

Preparations

Extract of Nux Vomica; dose $\frac{1}{4}$ to 1 grain.

Fluidextract of Nux Vomica; dose 1 to 5 minims.

Tincture of Nux Vomica; dose 5 to 15 minims.

This is the preparation most frequently used as a tonic.

Strychnine; dose $\frac{1}{30}$ to $\frac{1}{15}$ of a grain.

Strychnine Sulphate; dose $\frac{1}{30}$ to $\frac{1}{15}$ of a grain.

This is the preparation used hypodermically in collapse. In hospital practice it comes in a 1 per cent. solution or weaker.

Strychnine Nitrate; dose $\frac{1}{30}$ to $\frac{1}{15}$ of a grain.

Iron and Strychnine Citrate; dose 1 to 3 grains.

O

OAK

See QUERCUS.

OILS

Oils are substances which have a characteristic greasy feel and with whose physical characteristics the reader is no doubt familiar. Chemically they consist of a mixture of three substances: olein, stearin and palmitin, the three elementary fats. Each of these substances consists in turn of a fatty acid combined with glycerin. Oils are of two kinds: **fixed and volatile.**

Fixed oils comprise most of the oils in common use, such as olive, cottonseed and castor oil. The fixed oils do not evaporate easily. They are decomposed in the intestine by the digestive juices into a fatty acid and glycerin. The rancidity of fats and oils is due to a similar decomposition by heat.

The oils are utilized as foods, and medicinally they are very soothing substances. Many oils, however, such as castor oil and croton oil, when decomposed in the intestines form fatty acids which act as drugs.

Volatile oils are oils which evaporate very readily. When a volatile oil is allowed to stand for some time, some of its constituents evaporate, leaving a thick film which is called a stearoptene.

Volatile oils usually have a very pleasant aroma which gives the pleasant odor to the plants from which they are obtained. They are often called **essential oils**. The most common volatile oils are turpentine oil, oil of wintergreen, oil of peppermint, oil of camphor, etc.

OIL OF VITRIOL

See SULPHURIC ACID.

OINTMENTS

Ointments are preparations which are usually made up with lard, vaseline, or oils. They are applied to the skin

OLEATES

and are melted by the heat of the body and the drugs are then absorbed.

Ointment may be applied for a local or a general effect. They are the best means of applying remedies for a prolonged local effect. The fat in which the drug is contained dissolves readily but does not evaporate, thus prolonging the effect of the drug on the site of application.

The ointment should be spread on a piece of flannel or lint and applied to the site ordered; it should be changed frequently; about every day. Ointments should be avoided on discharging wounds as they prevent free drainage of the secretions. For a general effect they are applied by rubbing.

OLEATES

Oleates are medicinal substances dissolved in oleic acid, which is an ingredient of many oils and fats. Oleates are more easily absorbed than ointments.

OLEORESINS

Oleoresins are extracts of plant drugs made by dissolving the crude drug in acetone or ether. They contain the resinous substance and oils of the plant.

OLEUM MORRHUÆ

See COD LIVER OIL.

OLEUM RICINI

See CASTOR OIL.

OLEUM TIGLII

See CROTON OIL.

OPIUM

Opium is the hardened dried juice of the unripe capsules of the *Papaver somniferum* or white poppy, a plant which grows principally in Turkey, Asia Minor, Persia, India and China. The drug is obtained by making a longitudinal or transverse cut in the capsule, when a thick, white, milky juice oozes out. This is exposed to the air, and allowed to dry, when it turns brown and hard. This dried juice is the crude opium, from which all the preparations are made. It has a peculiar characteristic odor.

Opium relieves pain better than anything else, no matter what the cause of the pain may be.

Active Principles

The active principles of opium are the following alkaloids: **Morphine; Papaverine; Codeine; Narcotine; and Thebaine.**

OPIUM

Opium also contains a number of other unimportant substances.

The action of opium is due principally to the **morphine** which it contains, amounting usually to 9 per cent. of the drug.

Appearance of the Patient

About ten to fifteen minutes after giving an average dose of opium or morphine, the patient complains less of the pain from which he may have been suffering. He becomes calm, abstracted and quiet, and feels comfortable. When spoken to, he may not answer, because of his drowsy, abstracted condition; he may lie in a quiet, dreamy state.

Soon, however, the patient falls into a light sleep from which he can be easily aroused; often the sleep is deeper, resembling the natural sleep. The breathing is slow and shallow, the pulse is perhaps somewhat slower, the face is flushed, the pupils are contracted and the skin may be moist. These effects last for several hours, and gradually wear off, leaving the patient feeling dull and depressed, with dryness of the throat and occasionally a slight headache and nausea.

Local action: Applied to the skin, opium or morphine produces no effect.

Mucous membranes are contracted, and the secretions are checked by opium or morphine. It may be slightly absorbed from wounded surfaces and mucous membranes when locally applied to them, but whatever effects then result are due to absorption.

Action after Absorption.—Morphine is very rapidly absorbed into the blood through the mucous membrane of the stomach, usually in about ten or fifteen minutes. It can also be absorbed from all the mucous membranes. When given hypodermically, it acts in about two to five minutes. Opium preparations are absorbed more slowly. After absorption, opium and morphine affect principally the brain, the respiration, the secretory glands and the pupil.

Action on the Nervous System

On the brain: Opium or morphine lessens all the activities of the brain except the imagination, which is frequently made more active.

On the sensory areas: It lessens the activities of all the sensory areas of the brain. Thus the appreciation of all sensory impulses, especially that of **pain, is lessened**. Since consciousness is the result of the sensory impressions received through our sensations, by lessening the appreciation of the sensations, opium or morphine **produces unconsciousness or sleep**. When the patient is unable to

OPIUM

sleep on account of pain, these drugs are particularly valuable. The sleep is light, however, and the patient may be easily awakened. Often it is deeper and resembles the natural sleep.

On the motor areas: The action of the motor areas of the brain is slightly lessened, so that the patient is not quite so active.

On the mental activities: The higher mental activities of the brain, such as will power, judgment, reasoning, and concentration are all lessened.

Action on the respiration: Opium or morphine makes the breathing slower and shallower by lessening the impulses for breathing, sent out from the respiratory center in the medulla.

Action on the circulation: It produces no effect on the heart.

The blood vessels of the face and neck are dilated, however, causing a flushed face and a feeling of warmth.

The pulse after opium or morphine is usually normal and strong. With larger doses, the pulse is somewhat slower.

Action on the secretory glands: Opium or morphine checks all the secretions except the sweat, which it increases. The perspiration is increased more by the preparations of opium than by those of morphine.

Action on the involuntary muscles: The contractions of the involuntary muscles are lessened. Intestinal peristalsis is thus lessened; which, in addition to the diminished secretion of the intestines, causes constipation.

Action on the pupil: Opium or morphine contracts the pupil. It makes the pupil very small when given internally. When applied locally to the conjunctiva it produces no effects.

Excretion

Opium or morphine is rapidly eliminated from the body, mainly by the digestive tract, into the stomach, intestines and saliva and slightly by the urine, usually in about an hour. The drug is frequently absorbed again from the stomach and intestines.

Summary of Effects

The most important effects of opium or morphine are the following:

1. It relieves pain.
2. It makes the breathing slower.
3. It lessens all the secretions, except the sweat; which is increased.
4. It checks peristalsis, producing constipation.
5. It contracts the pupil.

OPIUM

Idiosyncrasies

a. Idiosyncrasies of Effect.—In some individuals, the following unusual effects occasionally occur:

1. Weakness and depression.
2. Continued nausea and vomiting.
3. Delirium and excitement. (This is especially apt to occur in women.)
4. Convulsions.
5. Redness of the skin and itching when the effects are passing off.
6. Diminished secretion of urine, especially in cases of nephritis.

b. Idiosyncrasies of Dose.—In some individuals a very small dose may cause very deep sleep, and even poisonous effects. In others, a very large dose may cause no effects at all, or only slight effects. Old people and children are very susceptible to opium or morphine. They may get poisonous symptoms from very small quantities.

Poisonous Effects

Acute Opium Poisoning

Acute opium poisoning usually results from an overdose given medicinally, or when a preparation is taken with suicidal intent. Old people and children are very susceptible to morphine.

Symptoms.—Since the most striking effect of opium is sleep, the symptoms are divided into three stages, according to whether the patient can be aroused from the sleep, whether he can be aroused with difficulty (stupor) or whether he cannot be aroused at all (coma).

Symptoms of the First Stage.—1. Slow, shallow breathing. (This frequently occurs from an ordinary dose.)

2. Slow, strong pulse.
3. Flushed face.
4. Contracted pupils.
5. Profuse perspiration.
6. Sluggish mentality, inattentiveness, perhaps sleep.

If a very large dose has been taken, these symptoms may last for a very short time, or they may be absent entirely, and are soon followed by—

The Second Stage or Stage of Stupor.—1. The sleep is very deep, and the patient can be aroused only with great difficulty. If spoken to in a loud voice, or when he is shaken and his attention attracted, he may brace up for a few minutes; but he soon falls asleep again.

2. The breathing is very slow and shallow, about 4 to 10 times a minute.

3. The pulse is slow and strong.

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4. The pupils are contracted ("pin point pupils" because they are very small).

5. The skin is blue (cyanotic), because the blood does not get enough oxygen on account of the slow and shallow breathing.

6. The skin is covered with perspiration.

These symptoms last for a short time, and the patient soon passes into—

The Third Stage or Stage of Coma.—1. The patient now lies in a very deep sleep, from which he cannot be aroused.

2. The breathing is very slow and shallow, about 3 to 4 times a minute. It often becomes periodic (Cheyne-Stoke's Respiration).

3. The pulse is rapid and weak.

4. The skin is blue (cyanosis).

5. Pin point pupils.

The breathing finally becomes still slower, the pupils dilate, and the patient dies from paralysis of the respiration, though the heart may beat for several minutes afterwards.

Synopsis of Poisonous Effects.—The following are characteristic symptoms of acute opium or morphine poisoning:

1. Sleep, stupor, followed by coma.

2. Slow and shallow breathing.

3. Slow pulse.

4. Contracted pupils, "pin-point pupils."

5. Cyanosis.

6. Profuse perspiration.

Treatment.—1. Wash out the stomach, with plain water, or better still, with a 1:2000 potassium permanganate solution, which makes the drug inactive. The washing should be repeated every half hour until the patient is entirely out of danger. Even if the drug is given hypodermically, the stomach should be washed out, as the drug is excreted into the stomach, and repeated washings help to eliminate it.

2. If the stomach cannot be washed out, for lack of apparatus, etc., or if a solid preparation has been taken, emetics should be given repeatedly, about every 15 minutes.

A tablespoonful of mustard in a glass of water, zinc sulphate 10 to 30 grains, copper sulphate 5 to 10 grains may be given to produce vomiting, and potassium permanganate to destroy the drug.

3. **Atropine**, $\frac{1}{100}$ of a grain, is given. This is the antidote for morphine. It should be repeated every hour until the breathing becomes deep and rapid again. It should never be given without the doctor's orders, however, as atropine poisoning may result from its injudicious use.

4. Apply cold douches on the skin, rub or strike the patient with wet towels. This keeps him awake and increases

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the breathing. Care must be taken, however, not to cause exhaustion by too violent measures.

5. Keep the patient warm.

6. Catheterize.

7. Keep up artificial respiration continuously.

8. Respiratory stimulants, such as caffeine, or a hot coffee enema, strychnine, etc., are given and should be frequently repeated.

9. The application of the faradic current to the vagus nerve in the neck may help the respiration in some cases.

The treatment of opium poisoning should be kept up for hours, as long as the patient is alive. Patients have recovered from as much as 30 grains of morphine, by persistent treatment.

Chronic Opium Poisoning or Opium Habit

The opium habit occasionally results in patients to whom it has been necessary to give opium or morphine for a long time. The pleasant effects of the drug and the ease with which it relieves pain and suffering often induce the habit. The drug is usually taken in the form of opium pills or laudanum. Hypodermic injections of morphine is one of the commonest ways in which the drug is taken.

Symptoms.—The characteristic symptom is the great craving for the drug. The other symptoms vary according to whether the patient is **without his drug** or **under the influence** of his usual dose.

When the habitué is not under the influence of the drug he usually has profuse sweating followed by abdominal cramps, twitching of the muscles and uncontrollable yawning. He is irritable and nervous. He is unable to do his work because he cannot concentrate his mind on anything.

When he gets his usual dose these symptoms disappear; he braces up, becomes energetic and is able to work, and he then feels quite comfortable. In many habitués there are no other effects. Usually, however, the devotee passes into a drowsy, dreamy state during which he has so much pleasure that he forgets—his physical pains, his cares, his worries, even his responsibilities. Many lie in this state for hours and fall into collapse when they attempt to get up. Finally, the habitué falls into a deep sleep lasting for several hours, and gradually awakes with headache, nausea and weakness.

Prolonged use, however, ultimately undermines both body and mind. The individual becomes thin and anemic. He has a loss of appetite and various other digestive disturbances. He is usually very constipated, although he may have attacks of profuse diarrhea. He becomes dull and listless,

OPIUM

with no self-control, no ambition and with no sense of truth or honor. Morphine habitués are most inveterate liars and cannot be trusted. Many of them develop all sorts of depraved moral tendencies and others become maniacal or insane.

They usually have a regular pulse, contracted pupils and irregular temperature. The arms may be full of needle marks and occasionally an abscess develops from the use of unsterilized needles.

The habit is treated by gradually withdrawing the drug, the administration of drastic cathartics, and hyoscine as an antidote. Stopping the drug suddenly may cause collapse.

Uses

Opium or morphine is used for a great many conditions. In fact, there is hardly a condition or disease in which this drug is not useful. It is used principally:

1. To relieve pain. For this purpose it is the best and most reliable drug.
2. To produce sleep, especially when the patient is unable to sleep on account of pain.
3. To lessen peristalsis and produce constipation.
4. To check the secretions, except the sweat.
5. To lessen all forms of nervous excitement, such as delirium tremens, convulsions, tetanus, etc.

Administration

For rapid effects, morphine, given hypodermically, is the best preparation to use. Opium is better where constipation is desired.

Preparations

Powdered Opium; dose $\frac{1}{2}$ to 2 grains.

This contains 12 per cent. of morphine.

Deodorized Opium; dose $\frac{1}{2}$ to 2 grains.

This contains 12 per cent. of morphine, but its odorous substances have been removed.

Pills of Opium; dose 1 pill.

Each pill contains 1 grain of powdered opium. These pills must be freshly made, as otherwise they accumulate in the stomach and cause poisonous effects.

Extract of Opium; dose $\frac{1}{4}$ to 1 grain.

This contains 20 per cent. of morphine.

Powder of Ipecac and Opium (Dover's powder); dose 10 grains.

Each powder contains 1 grain each of ipecac and opium, and 8 grains of milk sugar (it contains 10 per cent. of opium). Dover's powder is taken at night in hot lemonade,

ORTHOFORM

to break up a cold. It increases the perspiration very markedly.

Opium Plaster.

This contains 6 per cent. of opium.

Tincture of Opium (laudanum); dose 5 to 15 minims.

This contains 10 per cent. of opium.

Tincture of Deodorized Opium (McMunn's elixir); dose 5 to 15 minims.

This contains 10 per cent. of opium. It contains no narcotine, and no odorous principles, and is therefore more pleasant to take.

Camphorated Tincture of Opium (Paregoric); *For Adults*, 1 to 4 drams.

For children.—Under 1 year, 1 to 5 minims.

Under 2 years, 5 to 15 minims.

Under 3 years, 5 to 20 minims.

Under 5 years, 5 to 25 minims.

Under 10 years, 15 to 30 minims.

Paregoric contains 2 grains of opium to 1 dram, together with camphor, benzoic acid, oil of anise and glycerin. It is the best preparation of opium to use for children.

Tincture of Ipecac and Opium (Tincture of Dover's powder); dose 5 to 15 minims.

This contains 10 per cent. of opium.

Wine of Opium; dose 5 to 15 minims.

This is flavored with cinnamon and cloves.

Acetum Opii (Black drop); dose, 5 to 15 minims.

This is opium extract with dilute acetic acid.

Mistura Glycyrrhizæ Composita (Brown mixture); dose 4 to 8 drams.

This contains 1 part of opium in 1000 of the mixture. It consists of paregoric, licorice, wine of antimony, and spirits of nitrous ether. It is used to lessen cough.

Compound Tincture of Opium (Squibb's diarrhea mixture); dose 1 dram.

This contains tincture of opium, tincture of capsicum, spirits of camphor, chloroform and alcohol.

OPSONINS

See VACCINES, BACTERIAL.

OPTOCHIN

See ETHYLHYDROCUPREINE.

ORTHOFORM

Orthoform is an artificial chemical substance formed by the combination of methyl alcohol and amidoöxybenzoic acid.

OSTEOMYELITIS

It is used as a local anesthetic like cocaine, but since it is very slowly absorbed, it produces no general effects and no poisonous symptoms. It is not used hypodermically. It is used principally to relieve pain on a wounded surface and on mucous membranes. It is often used to relieve the pain of an ulcer in the stomach.

Preparation

Orthoform New; dose 8 to 15 grains.

It is often applied on wounds in the form of a dusting powder or as an ointment.

See COCAINE.

OSTEOMYELITIS

Osteomyelitis is an inflammation of the medulla or marrow of the bone. It may be acute or chronic, and generally results from a bacterial infection. All those compound fractures of the war, due to shrapnel and machine gun bullets, were complicated, as a rule, by osteomyelitis in varying degrees.

Symptoms.—The symptoms may consist of great pain referred to the bone affected, high fever, rapid pulse, and general malaise. There may be swelling, redness, and marked tenderness on pressure over the involved area.

Treatment.—The treatment is operative. An attempt is made to give the bone free drainage by incision through the skin and muscles and then sufficient cortex of the bone is removed to permit the pus in the medulla to drain freely. To insure free drainage the wound is packed with gauze, and to clean up the infection the bone and wound are Dakinized. If the condition is complicated by fracture, the limb is treated by suspension and traction, plus the Dakin treatment.

Because of the hardness and unyielding character of bone it will take a long while for the dead bone in the medulla to form a line of demarcation from the living, and that is why these cases of osteomyelitis linger so long before they are healed. The dead bone which often comes away in spicules at a dressing, or which is removed at some subsequent operation, is spoken of as a *sequestrum*.

Inasmuch as the majority of these cases will suffer for some time from a continual low grade toxemia, it is important to look after their general condition. These patients should be given as much fresh air as possible, kept on a high calorie diet, and, although confined to bed, the muscles of the affected limb should be given daily massage whenever possible. This will insure proper nourishment and maintain muscle tone, for it is well known that muscles not in active use are apt to undergo atrophy. The temperature

OVARY

should be carefully watched as any sudden rise might be indicative either of retention of pus somewhere in the wound, or the starting of a new focus in the same bone or another one.

OVARIAN EXTRACT

This is a powder made from the fresh ovaries of pigs. It is used to relieve the symptoms of the artificial menopause, such as flushes of the face and nervousness, which follow the complete removal of both ovaries. These symptoms result from the absence of the internal secretion of the ovaries.

Ovarian extract is given in doses 1 to 3 grains.

OVARY

The ovaries are two almond-shaped, glandular bodies, situated one on each side of the uterus, in the posterior fold of the broad ligament, behind and below the Fallopian tubes. Each ovary is attached at its inner end to the uterus by a short ligament—the ligament of the ovary—and at its outer end to the Fallopian tube by one of the fringe-like processes of the fimbriated extremity. The ovaries each measure about one and a half inches in length, and weigh from one to two drams.

The ovary besides secreting the ovum possesses an internal secretion which exercises a very important part in maintaining the normal nervous mechanism of the individual. Removal of both ovaries results in the complete cessation of menstruation and a train of nervous symptoms which make these patients objects of pity. They become very excitable, nervous, melancholy, and often so desperate that they have ended their existence by suicide. It is now the custom, whenever possible, to leave some part of the ovarian tissue, and should it be absolutely necessary to remove all of it, as in radical panhysterectomies for cancer of the uterus, the patient may be fed ovarian extract. Good results often follow.

Diseases of the Ovary.—Ovaritis is an inflammation of the ovary, rarely primarily diseased but usually secondary to tubal inflammation, which results in adhesions between both structures producing a condition spoken of as “diseased adnexa” or salpingo-oöphoritis. The symptoms are similar to those of salpingitis and the treatment employed is the same.

See FALLOPIAN TUBES, DISEASES OF.

New Growths.—Cysts.—More than any other organ, the ovary is apt to give rise to cysts and cystic degeneration.

OXALIC ACID

The cysts may be of small size, or grow to enormous dimensions weighing more than twenty pounds. They may be filled with a clear viscid fluid or with other cellular materials. Types of the last named variety are occasionally called cystadenomas. Certain of these tumors, if their contents are spilled over the peritoneal cavity, will cause secondary tumors acting much like malignant growths.

Dermoid Cysts.—These are tumors which contain remnants of the epidermis, such as hair; in addition bone is often found as well as other tissues.

Treatment of Cysts.—In the case of simple cysts, only part of the ovary affected may have to be removed, or if the entire ovary is filled with many small cysts, a complete oöphorectomy may be performed. It is highly important that cysts of the ovary be delivered intact. Every effort should be made to preserve their integrity, for occasionally a cyst may be of the adenomatous variety, and if accidentally ruptured the fluid escapes into the general peritoneal cavity and implantation growths take root.

In carcinoma of the ovary, the treatment, of course, is extirpation with subsequent X-ray or radium treatment. The general outlook for patients with ovarian carcinoma is indeed poor.

OXALIC ACID

Oxalic acid is an organic acid, found in **sorrel** and other vegetable substances. It is never used as a medicine, but **potassium oxalate**, or **essential salt of lemon**, and oxalic acid are frequently used to clean metal kitchen utensils. These salts resemble Epsom salts in appearance, and are a frequent cause of severe poisoning, when taken by mistake, or with suicidal intent. The symptoms are due to the removal of calcium from the blood and tissues, because the oxalic acid readily combines with it.

Oxalic Acid Poisoning

The symptoms usually appear in a few minutes:

1. Severe burning pain in the mouth or throat.
2. Intense cramp-like abdominal pain.
3. Profuse vomiting, the vomited matter containing mucus, pieces of mucous membrane and blood.
4. Muscular weakness and twitchings of the muscles.
5. Occasionally convulsions.
6. Collapse (rapid, irregular, weak, thready pulse, slow, shallow breathing, cyanosis, cold, moist skin, coma and death).

The patient may die in a few minutes from collapse; or in

OXYGEN

a few weeks from starvation or from nephritis, as a result of the injury to the stomach, intestines and kidneys. One ounce of oxalic acid usually proves fatal; though death has occurred from as little as one dram.

Treatment.—1. Neutralize the oxalic acid at once with an alkali, such as calcium. Lime-water, chalk or the plaster from the wall may be used for this purpose.

Do not give any preparation of sodium or potassium, as these form poisonous substances with the oxalic acid.

2. Give emetics.

3. Protect the mucous membranes with egg albumen, milk, etc.

4. The collapse is treated with heart stimulants, such as strychnine, caffeine, digitalis, etc.

OXYGEN

Oxygen is a gas which forms 20 per cent. of ordinary air, and is necessary for the life of all animals. It is inhaled by the lungs with the inspired air. From the lungs, it enters the blood and combines with the hemoglobin of the red blood cells. These cells carry the oxygen to the various tissues and organs of the body, where it combines with some of the constituents of their cells, and thus enables the organs to carry on their various activities.

Local Action.—Oxygen is a very good antiseptic, since most bacteria are unable to live in an atmosphere of pure oxygen.

Internal Action.—When pure oxygen gas is inhaled, it enters the plasma of the blood, from the air sacs of the lungs. Some of the oxygen combines with the hemoglobin, forming oxyhemoglobin, while part of it circulates uncombined, in the plasma. The formation of a greater amount of hemoglobin, gives the blood a brighter color, and the color of the skin then becomes more ruddy.

The improved condition of the blood makes the breathing slower, and slows and strengthens the heart action.

Uses

Oxygen is used in **pneumonia**, when the patient is blue and cyanotic, as a result of inability to obtain enough oxygen in the blood, because part of the lung is consolidated. The oxygen inhalations often relieve this blue color, and make the breathing easier.

Oxygen is also given in **potassium chlorate**, and in **illuminating gas poisoning**. These drugs combine with the hemoglobin of the blood, and prevent it from taking up oxygen from the lungs. The oxygen given in such cases

OXYGEN

enters the plasma in sufficient quantity to supply the tissues with nourishment until the hemoglobin is freed from the poisonous substance.

Administration

Oxygen should always be given continuously, inhaled through a mask from a tank beside the bed. The inhalations should be stopped when the symptoms disappear.

P

PAINS

See LABOR, MANAGEMENT OF.

PANCREAS

The pancreas is an elongated organ, of a pinkish color, which lies in front of the first and second lumbar vertebræ and behind the stomach. It weighs between two and three ounces, is about six inches long, two inches wide, and one-half inch thick. In shape it somewhat resembles a hammer, and is divided into head, body, and tail. The right end, or head, is thicker and fills the curve of the duodenum, to which it is firmly attached. The left, free end is the tail, and reaches to the spleen. The intervening portion is the body.

The duct, about the size of a goose-quill, runs lengthwise through the gland, from the tail to the head. The pancreatic and common bile duct usually enter by means of a common opening into the duodenum about three inches below the pylorus. Sometimes the pancreatic duct and the common bile duct open separately into the duodenum, and there is frequently an accessory duct which opens into the duodenum about an inch above the orifice of the main duct.

Surgical Conditions of the Pancreas.—The operations upon the pancreas are very few in number. The only diseases which need demand our attention are **pancreatitis**, either in chronic or acute forms, and cancer of the head of the pancreas. In inflammatory diseases of the pancreas, inasmuch as the bile is supposed to be an irritating and causative factor, its flow is short-circuited by draining the gall bladder (*cholecystostomy*). In the meanwhile the pancreas, free from the irritating effects of bile, will gain a much needed rest, and the inflammatory process may subside.

Carcinoma of the head of the pancreas may encroach upon the opening of the bile duct in the second portion of the duodenum causing intense jaundice. Inasmuch as new growths of the pancreas cannot be excised without a terrific

PANCREATIN

operative mortality and disastrous after-results, the only operation done to relieve the unfortunate jaundice victims is that of drainage of the gall bladder. The nursing procedures employed in these cases are similar to those used in operations upon the gall bladder.

PANCREATIN

Pancreatin is a mixture of all the ferments obtained from the fresh pancreatic glands of the pig. It is used principally to predigest foods, before they are given to the patient, in cases where the patient himself is unable to digest food.

Pancreatin can act only in the presence of an alkali, and must always be given with sodium bicarbonate. It is seldom given internally, as it is destroyed by the hydrochloric acid in the stomach.

When it is given internally, it should be given in pills coated with keratin, a substance which the acid of the gastric juice does not affect, but which is dissolved by the alkaline intestinal juices.

Pancreatin; dose 2 to 5 grains.

PAPAVERINE

Papaverine is one of the alkaloids obtained from opium. Papaverine acts like morphine only to a very slight degree. It relieves pain and lessens the activity of the brain only slightly, but it is somewhat of a local anesthetic.

It lessens the contractions of all involuntary muscles, such as those of the stomach, the ureters, gall ducts, and intestines.

It is therefore used to lessen the pains caused by the spasm of the involuntary muscles in ulcer of the stomach, gall stone colic, kidney colic, painful menstruation and painful urination. It is also used to lower blood pressure and to lessen the convulsions in eclampsia.

Papaverine does not induce a habit.

Preparations

Papaverine; dose $\frac{1}{2}$ to $1\frac{1}{4}$ grains.

Papaverine Hydrochloride; dose $\frac{1}{2}$ to $1\frac{1}{4}$ grains.

Papaverine Sulphate; dose $\frac{1}{2}$ to $1\frac{1}{4}$ grains.

PAPERS

Papers are small pieces of paper impregnated with medicinal substances.

PARACENTESIS

Paracentesis is tapping a cavity of the body for the purpose of evacuating fluid contained therein.

PARAFORM

Articles Required for Paracentesis

1. Small blanket for shoulders.
2. Board under springs, if patient is on edge of bed.
3. Back rest and two or three extra pillows.
4. Two chairs on which patient will rest her feet.
5. One chair for operator.
6. Large basin or pail to receive fluid.
7. Sterile bottle, if fluid is to be examined.
8. Laparotomy stockings.
9. Abdominal binder and safety pins.
10. Preparation tray, containing:
 - (a) Liquid soap.
 - (b) Bowl of hot water.
 - (c) Razor.
 - (d) Gauze sponges.
11. Tray, containing:
 - (a) Trocar and cannula, rubber tubing attached.
 - (b) Scalpel.
 - (c) Probe.
 - (d) Scissors.
 - (e) Artery clamp.
 - (f) Suture needles and suture silk.
 - (g) Forceps.
 - (h) Package of sterile sponges.
 - (i) Package of sterile towels.
 - (j) Gauze dressing, adhesive plaster.
 - (k) Local anesthetic.

Procedure.—Draw up patient's nightgown well above hips and pin securely in place with safety pins. Shave surrounding area, if necessary, and clean where puncture will be made, which is between umbilicus and pubes. Draw on laparotomy stockings and pin to nightgown on each side. Turn down upper bed clothes to foot of bed. Lift patient to side of bed and place in sitting position with feet on chairs and back supported by back rest on pillows. Cover shoulders with blanket. Place tray in convenient place for physician. Clean and disinfect hands, place sterile towel on each thigh, paint area with iodine. Assist operator as indicated. After removal of cannula, wound is dressed, patient returned to lying position, abdominal binder pinned on tightly. Dressing and binder will require changing later as fluid continues to exude.

PARAFFIN, LIQUID

See LIQUID PETROLATUM.

PARAFORM

See FORMALDEHYDE.

PARAFORMALDEHYDE

PARAFORMALDEHYDE

See FORMALDEHYDE.

PARALDEHYDE

Paraldehyde is a colorless liquid having a peculiar, unpleasant taste and odor. It is an oxidation product of alcohol.

A few minutes after an average dose of paraldehyde is given, the patient becomes drowsy and soon falls asleep. The sleep resembles the natural sleep, and lasts from about 5 to 6 hours, but it is not as deep as that of chloral. The pulse and breathing are normal, and there are usually no after-effects when the patient awakes. The action of paraldehyde is similar to that of chloral.

It has a hot, burning taste; and it often causes nausea and occasionally vomiting.

Paraldehyde is absorbed into the blood in a few minutes, through the mucous membrane of the stomach. After absorption, it acts principally on the nervous system. It lessens all the activities of the brain, thereby **producing sleep**; all reflex action is lessened, so that the patient does not respond readily to external stimuli; it lowers the temperature by lessening the production of heat.

Poisonous Effects

Paraldehyde rarely, if ever, causes fatal symptoms. Overdoses often cause the following symptoms:

1. Vomiting.
2. Stupor.
3. Slow, shallow breathing.
4. Cyanosis.

Prolonged use occasionally causes the following symptoms:

1. Nausea, loss of appetite, and poor digestion.
2. Ulcers in the nose.
3. Various eruptions, principally areas of redness.

Uses

Paraldehyde is used principally to produce sleep and to lessen muscular activity in epilepsy and delirium tremens. In giving paraldehyde, it is important to disguise its taste, otherwise many patients cannot take it. It should be well diluted in water, brandy, syrup, or sweetened butter. It should be given a few minutes before bedtime. Dose, 16 to 60 grains.

Paraldehyde is frequently given by the rectum, especially in cases of delirium tremens. The best method is to dissolve the drug in boiled starch and then inject it into the rectum through a catheter.

See CHLORAL.

PARANOIA

PARANOIA

This is a form of mental disease which occurs usually in adult or middle life and is characterized by the gradual development of an unchangeable progressive system of delusions, without marked mental deterioration.

The physical symptoms are those incident to worry, loss of sleep, etc.

Mental symptoms.—The mind shows little impairment. Memory is correct, orientation is not disturbed and consciousness is clear. Oftentimes there are hallucinations of hearing in which voices are calling the patient bad names, slandering and plotting against him. The most outstanding symptoms are the delusions of persecution, which are persistent, unchangeable and systematized, and strongly defended when attacked. They are not always absurd; and although the ideas are false they are so skilfully combined and woven together that the resulting scheme may appear reasonable. The emotions are determined by the delusions. The personality gradually undergoes a change, for in order to satisfactorily explain his persecutions the patient begins to think he must be a very unusual and important person inasmuch as everything which transpires about him seems to refer directly to himself, and he finally believes he is a great personage. The conduct is orderly except for occasional assaults due to the delusions. An intense hatred of individuals is oftentimes developed and fostered by the delusions, and the patient sometimes becomes very dangerous.

Nursing procedures.—As these patients are irritable, suspicious and quarrelsome, constantly on the lookout for slights and evidences of unfriendliness, much tact is required in caring for them. Whatever seems to irritate or annoy them should be removed in so far as possible, and references to whatever is known to be included in their delusions must be carefully avoided. They should be regularly occupied with some useful work in which they may be interested, and which of course does not conflict with their delusions. As the intellectual impairment is so slight they can many times be given work which carries some degree of responsibility and this always makes a special appeal. The care of the library, cataloguing, bookbinding, book-keeping, story writing and translating, leather work, block printing, wood carving, carpentry, basketry, weaving, the study of languages or science, and the study of architecture are some of the ways in which they may be employed. Many enjoy books of science, history and biography; and music, dancing, all the various indoor and outdoor games, sports and diversions should be provided. Careful observation

PARATOPHAN

and supervision are required at all times to prevent accidents.

PARATOPHAN

See ATOPHAN.

PARATYPHOID FEVER

Typhoid fever has two close relatives which nevertheless are quite distinct. These are known as **Paratyphoid A** and **Paratyphoid B**. They are due to germs much like the typhoid bacillus in many respects. They exhibit symptoms much like those of typhoid. The blood of a typhoid patient, which agglutinates typhoid bacilli, will agglutinate the paratyphoid bacilli also, if it is used in sufficient strength. Nevertheless, closely allied as they are, inoculation with dead typhoid fever germs, which protects the inoculated person against typhoid fever, does not protect against paratyphoid; and vice versa. Indeed, even the two paratyphoid diseases, A and B, are so distinct in this respect that the germ of each protects against itself but not against the other.

Paratyphoid fever has about the same incubation period as typhoid fever, a more abrupt outset, a shorter course and a lower fatality.

We know comparatively little about these diseases because they are in this country rather rare; they have not long been differentiated from typhoid fever, and being of less importance they have attracted less attention. They are usually overlooked or mistaken for mild typhoid unless laboratory tests are carefully made. The most conclusive of these is the testing of the blood for presence of the germ.

See TYPHOID FEVER, and INFECTIOUS DISEASES, COURSE OF.

PAREGORIC

See OPIUM.

PAROTITIS, EPIDEMIC

See MUMPS.

PEARSON'S SOLUTION

See ARSENIC.

PEDICULOSIS

See LICE, and SKIN DISEASES.

PELLETIERINE

See GRANATUM.

PELVIS

Obstetricians divide the pelvis into two portions—the upper part or *false pelvis*, and the lower part or *true pelvis*.

The **False Pelvis** is enclosed by the wings of the iliac

PELVIS

bones. It is of little moment in obstetrics, but when covered by the iliacus muscles it forms a cushion for the gravid uterus to rest upon, and also acts as a funnel to direct the head of the fetus into the brim of the true pelvis. It is of interest also in so far as its measurements bear a more or less constant relationship to those of the true pelvis. Of these measurements two are of importance.

(1) The *interspinous diameter* is the distance from one anterior superior spine of the ilium to the other, and measures $9\frac{1}{2}$ to 10 inches (23.75-25 cm.).

(2) The *intercristal diameter* is the distance between the widest apart points on the iliac crests, and measures $10\frac{1}{2}$ to 11 inches (26.25-27.5).

The inch of difference between these two measurements is the most important point, as it indicates a normal curvature of the iliac crests, a feature which is absent in the most common forms of contracted pelvis. The intercristal diameter is also approximately double the transverse diameter of the brim of the true pelvis.

The *intertrochanteric diameter* is the distance from one great trochanter of the femur to the other, and measures about 12 inches (30 cm.).

All these diameters may be measured clinically by means of a pelvimeter or large pair of callipers.

The **True Pelvis** is the all-important part in obstetrics. For convenience in description it is usually divided into three parts—the brim, inlet, or superior strait; the cavity; and the outlet or inferior strait.

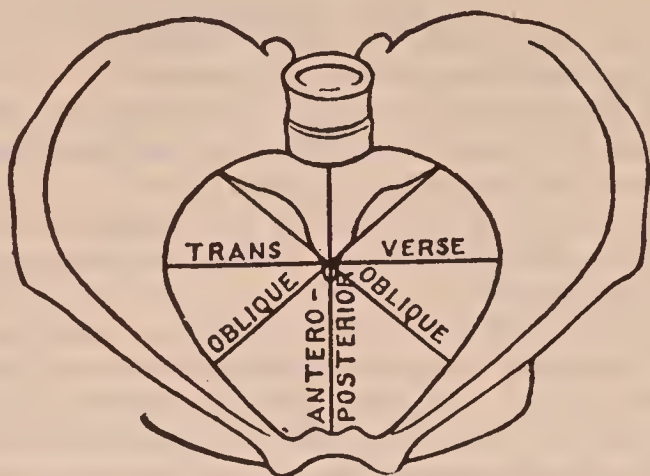
The *inlet* of the pelvis is somewhat heart-shaped owing to the projection forwards of the promontory of the sacrum.

The *cavity* is bounded above by the plane of the brim, and below by the planes of the outlet. In front it is bounded by the pubic bones, the front wall being thus about $1\frac{1}{2}$ to 2 inches deep (3.75-5 cm.). The lateral walls are formed by the ischia anteriorly, and the sacro-sciatic ligaments posteriorly, and are midway between the front and back walls as regards depth. The back wall is formed by the sacrum and coccyx, is curved and long, measuring about $4\frac{1}{2}$ to 5 inches (11.25-12.5 cm.) In shape the cavity is roughly circular, and with the woman in the upright position it is at no horizontal level bounded entirely by bone. Owing to the curve of the sacrum the direction of the cavity alters as it passes down. The upper portion is directed downwards and backwards, and is straight as far as the junction of the second and third bodies of the sacrum. There it begins to curve forwards, and at the actual outlet is directed downwards and forwards.

The *outlet* of the pelvis is lozenge-shaped. It is bounded

PELVIS

posteriorly by the coccyx and the sacro-sciatic ligaments, and anteriorly by the lower edge of the symphysis and the rami of the pubes. Laterally it is bounded by the tuberosities of the ischia.



Diameters of the Brim or Inlet.
(From Johnstone's Textbook of Midwifery)

DIAMETERS OF THE TRUE PELVIS

Brim.—(1) The *antero-posterior* diameter is measured from the center of the promontory of the sacrum to the top of the symphysis pubis. Owing to the rather elliptical shape of the brim and the fact that the shortest diameter of an ellipse is called the conjugate, this measurement is often spoken of as the *conjugate diameter*. Strictly speaking, there are two conjugates to be described, according as the measurement is taken to the summit of the symphysis or to the upper margin of the posterior surface. Owing to the beveled shape of the top of the symphysis there may be almost a quarter of an inch (0.6 cm.) difference between the two, and obviously this space is not available for the passage downwards of the head. The measurement to the very summit is therefore called the *anatomical conjugate* or *conjugata vera*; while the diameter measured to the upper edge of the posterior surface is known as the *obstetrical* or the “available” *conjugate*. The former measures $4\frac{1}{4}$ inches (10.6 cm.), the latter about 4 inches (10 cm.).

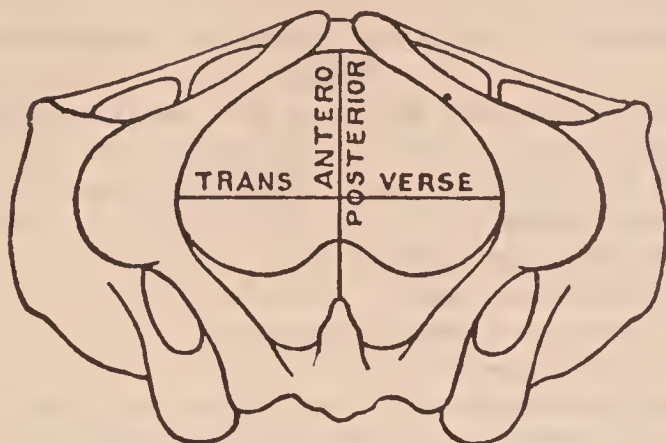
The *right oblique diameter* is measured from the right sacro-iliac joint to the left ilio-pectineal eminence. It measures $4\frac{1}{2}$ inches (11.25 cm.).

The *left oblique diameter* is measured from the left sacro-iliac joint to the right ilio-pectineal eminence. It measures $4\frac{1}{2}$ inches (11.25 cm.).

The *transverse diameter* is the greatest distance between the two ilio-pectineal lines. It measures 5 inches (12.5 cm.).

PELVIS

Cavity.—In the cavity at the level of the third sacral vertebra, and the middle of the posterior surface of the symphysis, all the diameters—*antero-posterior*, *oblique*, and *transverse*—measure about $4\frac{1}{2}$ inches (11.25 cm.).



Diameters of the Outlet.

(From Johnstone's Textbook of Midwifery)

Outlet.—The *antero-posterior diameter* is measured from the tip of the coccyx to the center of the under margin of the pubic symphysis. With the coccyx pointing forward it measures about 4 inches (10 cm.), but with the coccyx turned backwards as in labor it measures 5 inches (12.5 cm.).

The *transverse diameter* is measured between the inner (medial) surfaces of the ischial tuberosities and is 4 inches (10 cm.).

The *diagonal conjugate diameter* is the distance from the center of the promontory of the sacrum to the center of the under margin of the symphysis. It usually measures about $4\frac{3}{4}$ inches (11.9 cm.), varying a little with the depth and the inclination of the symphysis. Subtraction of from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch (1.2-1.9 cm.) from this measurement gives us the approximate size of the conjugate of the brim.

The most important diameters of the true pelvis may be memorized conveniently from the following table:

	Antero-posterior. In inches.	Oblique. In inches.	Transverse. In inches.
Brim	4* (10 cm.)	$4\frac{1}{2}$ (11.25 cm.)	5 (12.5 cm.)
Cavity	$4\frac{1}{2}$ (11.25 cm.)	$4\frac{1}{2}$ (11.25 cm.)	$4\frac{1}{2}$ 11.25 cm.)
Outlet	5§ (12.5 cm.)	$4\frac{1}{2}$ (11.25 cm.)	4 (10 cm.)

* Obstetrical conjugate. § Coccyx turned back as in labor.

PENTAL

This table shows at once two important facts: (1) that the pelvis diminishes in transverse measurement as we pass down; and (2) that while at the brim the longest diameter is the transverse, at the outlet it is the antero-posterior, and conversely.

Characteristics of the Female Pelvis as Compared with the Male

1. Bones lighter and smoother, and muscular attachments less marked.
2. Iliac crests farther apart. Iliac fossæ more hollowed.
3. Sacrum broader.
4. Promontory less pronounced.
5. Symphysis less deep.
6. Brim more oval, less heart-shaped.
7. Inlet more capacious.
8. Cavity shallower: less funnel-shaped: roomier.
9. Outlet wider: ischial tuberosities farther apart.
10. Pubic arch wider, 90° to 100° —in male about 75° .
11. Coccyx more movable.
12. Acetabula farther apart.

PENTAL

See ANESTHETICS.

PEPO (PUMPKIN SEED)

Pepo is the ripe seed of *Cucurbita pepo* or the ordinary pumpkin. Its active principle is a fixed oil and a resin.

Pumpkin seeds are a very efficient and harmless remedy for tape worms.

Administration

The patient should fast the day before the drug is to be given, and the following morning about two to four ounces of the seeds, beaten up in an emulsion of sugar and water, or honey, should be given. Occasionally, half an ounce of the expressed oil is given. It should always be followed by a cathartic several hours later.

See ANTHELMINTICS.

PEPSIN

Pepsin is a ferment obtained from the lining membrane of fresh stomachs of healthy pigs. It is used to aid digestion in cases where the pepsin of the gastric juice is diminished.

Pepsin acts only in the presence of an acid; it should therefore always be given with dilute hydrochloric acid. Alkalies destroy its activity; it should therefore never be given with such substances as sodium bicarbonate.

Dose of **Pepsin** 5 to 10 grains.

PERNICIOUS VOMITING

PEPTONIZED MILK

See MILK.

PERINEORRHAPHY

The perineum is sometimes torn during childbirth. A perineorrhaphy is an operation in which the lacerated perineum is sutured.

The *after-treatment*, like that of any other wound, is extremely important. Its care is the responsibility of the nurse. All strain on sutures, whether due to restless movements or to straining at stool, must be avoided. Sometimes it is necessary to bandage the thighs together. The sutures must be kept scrupulously clean and free from infection. Some surgeons require the patient to be catheterized for the first three to five days to avoid contamination of the wound with urine. All dressings are carried out with strict aseptic precautions, as in treating an abdominal wound. After the use of the bedpan, the part is irrigated with boric acid solution and very gently sponged until quite clean. The parts are then dried gently. Dry sterile dressings are usually applied. Aristol (an antiseptic), or zinc oxide ointment is frequently used. Any symptoms of inflammation—soreness, redness, swelling—in the wound should be noted and reported. Hot moist antiseptic dressings may be ordered in such cases. Dressings are held in place with a T binder.

When vaginal douches are ordered following a perineorrhaphy, a soft rubber catheter or an irrigating tip instead of the usual douche nozzle should be used. The douche should coincide with one of the usual dressings so as not to disturb the wound more than is absolutely necessary.

PERINEUM, CARE OF

See LABOR, MANAGEMENT OF.

PERITONSILLAR ABSCESS

See PHARYNX.

PERNICIOUS VOMITING (POST-OPERATIVE)

This may occur in children as well as in adults, and is usually a manifestation of what is commonly spoken of as "acidosis," a condition in which the normal alkalinity of the blood is diminished. It is recognized by the sweet and fruity odor of the breath. If this condition be suspected, the urine should be examined for the presence of acetone. If it be present, gastric lavage should be given, everything stopped by mouth, and alkalies administered immediately either by a ten per cent. sodium bicarbonate solution in a

PETIT MAL

Murphy drip, or intravenously in three to five per cent. solution, but never by clysis.

Sodium bicarbonate is given until it is excreted by the kidneys. When the urine is alkaline it is safe to assume that sufficient bicarbonate has been administered to bring the blood back to its normal alkaline reaction, thus reducing the acidosis which is the underlying cause of vomiting in these particular cases. There is one point, however, which needs emphasis in the administration of sterile sodium bicarbonate solutions. After the desired solution has been compounded, it must be sterilized. Sterilization, by its heat, drives off carbon dioxide, thereby reducing the bicarbonate of soda to sodium carbonate. This compound is not as good as the bicarbonate because it is more irritating to the tissues, and is not as effective in reestablishing the alkalinity of the blood. To counteract this, after the solution has been cooled sufficiently, carbon dioxide may again be added by connecting a sterile tube to a carbon dioxide tank and allowing the gas to bubble through the sodium carbonate fluid for a sufficient length of time, thus making a bicarbonate compound.

PETIT MAL

See EPILEPSY.

PETROLATUM, LIQUID

See LIQUID PETROLATUM.

PHARYNGITIS

See PHARYNX AND TONSILS.

PHARYNX AND TONSILS, DISEASES OF

The pharynx is that cavity that is between the mouth, nose and esophagus. It is cone shaped and about five inches in length. In front and on each side are openings which communicate with the ears, nose, mouth and larynx. They are as follows:

1. Posterior nares leading to the nose (2)
2. Eustachian tubes leading to the ears (2)
3. Fauces leading to the mouth (1)
4. Opening into the larynx (1)
5. Opening into the esophagus (1)

The most common pharyngeal disorder is inflammation of the pharynx, known as **pharyngitis**. It is usually the result of infection spread from the nose, ears and mouth by the mucous membrane with which it is lined and which is continuous with the communicating passageways. It is

PHARYNX AND TONSILS

characterized by redness, swelling and some difficulty in swallowing. Relief can readily be obtained by external application of ice or cold compresses, and the use of gargles and sprays.

Chronic pharyngitis occurs in smokers, those who habitually inhale dust or irritating vapors and in alcoholics.

On either side of the pharynx there are two almond-shaped bodies, the **tonsils**. They are situated between the anterior and posterior pillars of the fauces, and are composed of lymphoid tissue. Their exact function is not known, but they seem to be protective organs. Inflammation of the tonsils, or **tonsillitis** may be classed as:

1. Acute
2. Follicular
3. Suppurative
4. Chronic

Tonsillitis usually occurs during youth, and may result from exposure to cold, wet, changeable climate, rheumatic diathesis, or acute exanthematous diseases.

Acute tonsillitis is characterized by redness, swelling of the tonsils and adjacent tissues, pain, difficult swallowing, rise in temperature, chilliness and general malaise.

Acute follicular tonsillitis differs from the above, in that the little depressions or crypts of the tonsils are the seat of tiny abscesses, and appears as white spots, one or many on each tonsil. It is caused by the *streptococcus pyogenes*; there is extreme pain on swallowing, rise in temperature, headache, very painful joints, loss of appetite and weight. An attack usually lasts about a week.

Treatment for both of the above consists of:

1. Cathartic, usually calomel in divided doses, followed by magnesium sulphate.
2. Hot saline irrigations every one-half to one hour.
3. Medicines such as salicylates, aspirin, etc.
4. Rest in bed in a well-ventilated room.
5. Nutritious liquid diet.

Extreme care should be used in the sterilization of irrigator tips and cans, as well as in the use of dishes and utensils.

Suppurative tonsillitis, peritonsillar abscess, or quinsy. Whereas in follicular tonsillitis, the little abscesses open into the mouth, in the suppurative type they are underneath the tonsils so deeply that they cannot discharge externally, and may become so large as to push the tonsil to, or past, the mid-line of the throat. Pain and prostration in this condition are extreme. If allowed to go on it will rupture into the mouth, therefore it is better to lance early and thus

PHARYNX AND TONSILS

end the severe pain and prevent possible fatal results. After incising, the throat should be irrigated with antiseptic solution every hour or so to insure perfect drainage.

Chronic tonsillitis, or **chronically enlarged tonsils**, are often found existing from birth, as the result of scarlet fever, diphtheria, acute tonsillitis, or as a part of a general enlargement of all the lymph tissue in the body. It must be remembered that the tonsils may not be painful, may not be red or swollen, but nevertheless, be the seat of a chronic infection, and a menace to the whole body. For to the germs they harbor, which are constantly entering the circulation, are due many attacks of acute articular rheumatism, chronic rheumatism, many cases of acute endocarditis, nephritis, many ear and eye troubles, and furthermore, they furnish a fertile field for the development of diphtheria and recurring attacks of follicular tonsillitis. It is being realized more and more that practically the only treatment for chronically enlarged tonsils is the removal of the same by tonsillectomy.

Diphtheria is a disease primarily of the tonsils and pharynx but affecting the whole system. It is caused by the Klebs-Loeffler bacilli invading the throat, usually the tonsils, as they afford heat and moisture necessary to their multiplication. The bacilli remain at the site of local invasion, and give off toxins which, when absorbed, give rise to toxic symptoms. At first there is merely a hyperemia of the throat, but later a false—or pseudo—membrane is formed. This is at first gray, but soon becomes a brownish color. It cannot be readily taken off, and if removed leaves a raw, bleeding surface. *Symptoms*: sore throat, malaise, elevation of temperature, loss of appetite, headache, enlarged glands, difficult swallowing and breathing, and the presence of the membrane.

Treatment:

1. Isolation of the patient.
2. Antitoxin.
3. Rest in bed (very important because the heart is very susceptible to the poisons of diphtheria, and may become permanently damaged).
4. Care to prevent spreading of the disease.

Any case that looks like diphtheria should be quarantined and given antitoxin immediately. Quarantine is removed when all symptoms have disappeared and three successive throat cultures prove negative.

Vincent's angina is produced by the *spirillum* of Vincent. This spirillum, although ordinarily present in the mouth, occasionally becomes virulent and attacks the tonsils. It produces lesions covered by a white membrane which is

PHARYNX AND TONSILS

easily removed, but generally returns. There are headache, lassitude, severe pain, moderate rise in temperature, glandular enlargement, salivation, and very foul breath. *Treatment* of this condition varies, but may consist of: (1) painting area with saturated solution of gentian violet; (2) painting with iodine; (3) irrigation or gargles with solution of potassium chlorate, or small internal doses of potassium chlorate.

Nursing care consists of:

1. Rest in bed in a well-ventilated room.
2. Nutritious liquid diet.
3. Cathartics.
4. Frequent gargles or sprays.
5. Extreme care for prevention of spreading infectious material.

Carcinoma of tonsils, although rare, may occur around the fortieth year. Treatment is removal of the tonsil. It is not very successful, for the deeper structures are usually involved.

Chancre of tonsil, originating from careless use of knives, forks, glasses, dental instruments, etc. There is a sore throat of gradual onset. The chancre appears on the tonsil about one-fourth inch deep, with well cut edges, surrounding tissue indurated, very little pain, marked glandular enlargement in the neck, and Wasserman reaction. *Treatment* is anti-syphilitic. Great precautions must be taken to prevent infecting others.

Tonsillectomy prevents diseases of the tonsils. There are two methods of doing it.

1. Under general anesthetic.
2. Under local anesthetic.

Persons over fifteen should have local anesthetic, for otherwise they are apt to get abscess of lung from blood getting into the trachea.

Pre-operative precautions are:

1. Specimen of urine to laboratory.
2. Coagulation test.
3. Physical examination.
4. History of case.

Post-operative treatment and care:

1. Patient to be carefully watched.
2. Report immediately any undue hemorrhage or vomiting of blood.
3. Keep blood out of mouth.
4. Water to drink when nausea ceases.
5. Put patient in any comfortable position.
6. Liquid diet one day, then soft diet with care.
7. Ice collar to neck, if desired.

PHENACETIN

8. Cathartic following morning, and patient can be up and around.

In case of post-operative hemorrhage:

1. Call doctor at once.
2. Apply ice to throat.
3. Keep absolutely quiet.

PHENACETIN

See ACETPHENETIDIN.

PHENOCOLL

Phenocoll is an artificial chemical substance which acts like phenacetin, but is said to be safer. It has been used as a substitute for quinine, in malaria.

Preparations

Phenocoll Hydrochloride; dose 5 to 20 grains.

Phenocoll Salicylate; dose 15 to 30 grains.

This combines the effect of phenocoll with salicylic acid, and is used to relieve rheumatic pains.

Salocoll; dose 8 to 15 grains.

See ANTIPYRETICS.

PHENOL

See CARBOLIC ACID.

PHENOLPHTHALEIN

Phenolphthalein is a chemical substance made from carbolic acid, phthalic anhydride and sulphuric acid.

It is used in the laboratory to test the reaction of various substances, since it turns red when an alkali is added to it.

Phenolphthalein acts as a very good purgative, producing frequent soft stools with little griping. It acts on the large intestine, increasing peristalsis and preventing absorption of fluids, thus causing bowel movements. Dose 2 to 3 grains.

PHLEBITIS (POST-OPERATIVE)

This condition is an inflammation of the veins, usually of the lower extremity. It is rather late in onset and is annoying because the patient is confined to bed for a longer period of time. It is manifested by cramp-like pains in the leg, a rise in temperature, and a feeling of general malaise. Examination of the affected extremity shows that the part is swollen and the skin over the veins reddened. Occasionally the veins may be palpated. The treatment calls for absolute rest, elevation of the affected part and immobilization, the part being kept warm by a wrapping of cotton, or the additional heat of an electric pad. Phlebitis may be associated with, or followed by thrombosis.

PHLEGMASIA ALBA DOLENS

PHLEGMASIA ALBA DOLENS

Synonyms are **White Leg**—**Septic Thrombophlebitis**.—

Two separate pathological conditions, which are sometimes combined, are included under this term.

(1) The *thrombotic* form of phlegmasia is a septic thrombophlebitis of the femoral or other veins of the lower limb. This is usually continuous with a similar process in the uterine veins, but it may be independent. The phlebitis and thrombosis tend to spread down the limb, and the venous return is obstructed, with the result that the whole lower limb from the foot up becomes markedly edematous. The veins of the upper limbs are occasionally, but rarely, affected in the same way. The swollen limb pits on pressure, and in thin patients the affected veins may be felt as tender cords.

(2) The lymphatic or cellulitic form is really a deep cellulitis, usually but not invariably continuous with a parametritis. The glands in the groin are frequently enlarged and tender. The swelling becomes very tense and hard, and soon ceases to pit on pressure, while the skin becomes white and glossy. If the skin is pricked the fluid that exudes is coagulable lymph, not the simple serum of the thrombotic edema.

Etiology.—The lymphatic form—the true “white leg”—is certainly septic in origin. It is rare now since the introduction of antiseptic methods. The thrombotic form is probably also septic in origin in most cases, the phlebitis being secondary to the infection of the thrombus. But the condition of the blood is an important element, for the disease is much commoner after serious hemorrhages during labor, and in anemic women.

Frequency.—About 1 in 400. The thrombotic form is much the commoner.

Symptoms.—The left leg is more commonly affected than the right. This is probably because cervical tears are more common on that side, but the presence of the rectum may also tend to cause thrombosis on that side more easily.

In most cases the early days of the puerperium have not been quite free of some slight feverishness. About the middle or end of the second week—often the tenth day—the temperature rises abruptly. There may be a slight rigor. Pain is felt in the affected limb, either in the thigh, calf, or ankle. The veins may be found tender to the touch.

Swelling of the limb begins in the foot and spreads upward. In the thrombotic form it always pits on pressure, never attaining the tense, brawny hardness of the real “white leg.” Several days after the first onset the second leg is sometimes affected.

PHLORIDZIN

Under treatment the fever and pain last for a few days, and then gradually subside. Usually the veins regain their patency, and the swelling of the limbs gradually disappears in the course of several weeks. In the lymphatic form the swelling takes longer to disappear, and some swelling may persist for months, or even years.

Treatment.—This is almost entirely symptomatic. Movement of the limb must be prevented, partly to diminish the pain, but more particularly to prevent the detachment of any portion of clot with its possibilities of consequent disaster. The limb should be raised on one or two pillows, or slung in a cradle, and movement prevented by sandbags. The pain may be relieved by hot fomentations of lead and opium, or 1 in 80 carbolic lotion. When not being fomented, the limb should be wrapped in cottonwool. Even after the acute symptoms have passed off, voluntary movement should be avoided until the swelling has to a great extent disappeared. In the late stages, when all risk of embolism has ceased, gentle massage is helpful.

PHLORIDZIN

Phloridzin is a glucoside obtained from the roots of the apple, pear, cherry, and other trees.

It is occasionally used to destroy malarial parasites. It forms sugar in the urine and increases its secretion. Because of its irritating effect on the kidneys, it is rarely used, except to test the action of the kidneys. Dose 5 to 10 grains.

PHOSPHORUS

Phosphorus is a non-metallic element obtained from bones by the action of sulphuric acid and water. It is a semi-solid, soft, wax-like, colorless or yellowish substance, which emits light in the dark, and has an odor of garlic.

Phosphorus is found in the body in many tissues, especially in nerve and bone tissue. In nerve tissue, phosphorus is present in large quantities combined with fats. These substances are called lecithins, or phosphorized fats. In the bones, phosphorus is combined with calcium, sodium, or magnesium. Phosphorus is also contained in many vegetables.

Action

1. The principal effect of phosphorus is to increase the growth of bone.
2. It slightly increases the formation of red blood cells but it does not increase the hemoglobin.
3. It is said to improve the nutrition of nerve tissue by

PHOSPHORUS

supplying them with their necessary phosphorus. The hypophosphites and glycerophosphates are the preparations used.

Poisonous Effects

Phosphorus poisoning occurs in two forms: acute poisoning and chronic poisoning.

Acute Phosphorus Poisoning

Acute phosphorus poisoning usually results from phosphorus taken with suicidal intent. Many pastes used to destroy vermin, or match heads which contain phosphorus, are the substances usually taken.

Symptoms.—The following are the characteristic symptoms which appear in about three to twelve hours. If an oily solution, or a paste is taken, they appear more rapidly; if the preparation is a solid one, they appear later.

1. Abdominal pain.
2. Nausea, vomiting and diarrhea.
3. The vomitus and stools, as well as the urine, emit light when held in the dark and have an odor of garlic.
4. Jaundice.
5. Collapse and coma.

Death from phosphorus poisoning has resulted from $\frac{3}{4}$ to 2 grains. It has occurred in a few hours to a few weeks.

Treatment.—1. **Old common crude turpentine**, or French acid turpentine, about half a dram every fifteen minutes is given as an antidote. This forms a hard, solid mass with the phosphorus, and prevents its absorption.

2. Occasionally hydrogen peroxide, or potassium permanganate, may be given to oxidize the phosphorus.
3. Copper sulphate may be given to produce vomiting. It is also an antidote, and is best given in two grain doses every five minutes, until vomiting is produced. After that half a grain may be given every twenty minutes as long as ordered.
4. Wash out the stomach.
5. Give cathartics, especially salines such as hydrated magnesia.
6. Protect the mucous membrane with albuminous drinks as the white of egg, etc.
7. **Do not give oils or fats, as these hasten the absorption of the phosphorus.**
8. The collapse is treated with stimulants.

Chronic Phosphorus Poisoning

Chronic phosphorus poisoning usually occurs as a result of continually inhaling the phosphorus fumes, in individuals who work in phosphorus match factories. It occurs most

PHOSPHORUS

frequently from the use of the yellow phosphorus, which has now mostly been given up, and the symptoms are therefore now rarely seen.

Symptoms.—The symptoms usually begin with a carious tooth, or a sore gum. The gums become swollen and painful, abscesses of the jaw often form, with **destruction of pieces of the jaw bone**. Occasionally there may be **slight jaundice, anemia, diarrhea**, albumin in the urine, etc.

Treatment.—Thorough ventilation of the factories where phosphorus is used, to get rid of the fumes, and the inhalation of the crude turpentine, usually prevent the condition.

When abscesses of the jaw form, they must be treated surgically.

Uses

Phosphorus preparations are used in the following conditions:

1. In nervous diseases, such as neurasthenia, and other similar diseases, as a nerve tonic.
2. To harden the bones in rickets, osteomalacia, etc.
3. To increase sexual activity.

Preparations

Phosphorus; dose $\frac{1}{100}$ to $\frac{1}{50}$ of a grain.

Pills of Phosphorus. Each pill contains $\frac{1}{100}$ of a grain of phosphorus.

Phosphorated oil; dose 1 to 5 minims.

This contains about 1 per cent. of phosphorus in almond oil and ether, and is occasionally used.

The following preparations are made from **phosphoric acid**, which is formed when phosphorus is burned.

Dilute Phosphoric Acid; dose 5 to 15 minims.

This contains 10 per cent. of the pure phosphoric acid.

From the phosphoric acid the following salts are obtained:

Precipitated Calcium Phosphate.

This is rarely given alone, but in the form of an emulsion of cod liver oil and lactophosphate of calcium. Each dram contains 2 grains of calcium phosphate and half a dram of cod liver oil.

Zinc Phosphide; dose $\frac{1}{20}$ to $\frac{1}{2}$ of a grain.

The following preparations are made from **hypophosphorous acid**:

Calcium Hypophosphite; dose 15 to 30 grains.

Iron Hypophosphite; dose 15 to 30 grains.

Potassium Hypophosphite; dose 15 to 30 grains.

Sodium Hypophosphite; dose 15 to 30 grains.

Syrup of Hypophosphites; dose 1 to 2 drams.

PHYSOSTIGMA

This contains the hypophosphite of calcium, sodium and potassium, also the tincture of lemon peel and sugar.

Compound Syrup of Hypophosphites; dose 1 to 2 drams.

This contains iron hypophosphite in addition to the ingredients in the syrup of hypophosphites.

The following preparation is made from **glycerophosphoric acid**:

Calcium Glycerophosphate; dose 3 to 10 grains.

Various syrups and wines of glycerophosphates are on the market. Many of them are combined with iron. They are all good tonics.

PHYSOSTIGMA AND ESERINE

Physostigma is obtained from the **Physostigmine venenosum**, the calabar bean, or ordeal bean.

Its active principle is an alkaloid, **eserine**, or **physostigmine**.

Appearance of the Patient

About fifteen minutes after giving a dose of eserine, the patient usually complains of cramp-like pains in the abdomen and slight weakness. He often feels somewhat nauseated and the bowels move very freely, the stools being quite fluid. There is usually a profuse secretion of saliva and perspiration.

The pulse is slow and weak, and the breathing is at first somewhat rapid and deep, but later it becomes slow and shallow. The pupils are contracted, and the patient is unable to see distant objects clearly. He usually complains of weakness.

Action

The action of physostigma is due to the eserine which it contains. This is the preparation commonly used. The effects of eserine are quite similar to those of pilocarpine. They are due to stimulation of the nerve endings.

Local action: **Applied to the skin, or mucous membranes**, it produces no effects, but the drug is readily absorbed from mucous membranes.

Internal Action.—In the mouth: No effects are produced.

In the stomach and intestines: It markedly increases the secretions of the mucous membranes and the peristalsis, much more so than pilocarpine does. Cramp-like abdominal pains with frequent fluid stools result.

Action after Absorption.—Action on the involuntary muscles: Eserine increases the contractions of all the involuntary muscles, by increasing the activity of the nerve endings in the muscle wall.

The muscles of the intestines are particularly affected,

PHYSOSTIGMA

the peristalsis is very much increased, and frequent fluid movements of the bowels result. The contractions of the muscles of the ureter, bladder and uterus are also increased.

Action on the pupils: It contracts the pupil if applied locally to the conjunctiva, or when given internally. Eserine also contracts the ciliary muscle of the eye, a muscle which holds the lens in place. The contraction of this muscle makes the lens more convex, so that the patient is unable to see distant objects clearly. It also causes a free circulation of fluid from the posterior to the anterior chamber of the eye, thereby making the eyeball softer. Eserine is often used to produce this effect in glaucoma, a disease in which the eyeball becomes hardened, and which often results in blindness.

Action on the secretory glands: Eserine increases the secretion of all the secretory glands, by making their nerve endings more sensitive to receive impulses for secretion.

On the heart: eserine makes the heart beat slower, by making the nerve endings of the vagus nerves in the heart more sensitive to receive impulses for slowing the heart.

On the blood vessels: The contraction of the involuntary muscle fibers in the walls of the blood vessels makes the blood vessels narrower. The blood pressure is thus raised; usually, however, this effect is not very marked. **The pulse of eserine is therefore slow and strong.**

Action on the respiration: The breathing is at first rapid and deep; later, it becomes slow and shallow.

Action on the spinal cord: It lessens the reflex action of the spinal cord and medulla.

Excretion

Eserine is very rapidly eliminated from the body by the urine and by all the secretions. It begins to be excreted in a few minutes, and is entirely eliminated in a few hours.

Poisonous Effects

Since eserine is very rapidly excreted, only acute poisoning occurs; usually from an overdose of the drug, given hypodermically or dropped into the eye.

Symptoms.—1. Abdominal cramps.

2. Nausea and vomiting.

3. Diarrhea, with frequent watery stools.

4. Excessive flow of saliva and perspiration.

5. Rapid, then slow, shallow, difficult breathing.

6. Slow, irregular, weak pulse.

7. Contracted pupils.

8. Twitchings of the muscles, beginning in the legs and

PILLS

extending to the upper extremities, with great muscular weakness.

9. Collapse.

Treatment.—1. Wash out the stomach.

2. Keep the patient warm.

3. Give artificial respiration.

4. Atropine is given hypodermically. This is the antidote, as it paralyzes the overacting nerve endings, and increases the breathing.

5. The collapse is usually treated with heart stimulants.

Uses

Eserine is principally used in the following conditions:

1. To soften the eyeball in glaucoma, and to contract the pupil.

2. To increase the peristalsis, to cause frequent movements of the bowels, and to expel gas. It is frequently used for the latter effect, on patients that have just been operated upon, and who have difficulty in passing gas; especially after gynecological operations. It should be avoided when the operation has been performed upon the stomach or intestines.

3. It is occasionally used in chronic constipation.

Preparations

Extract of Physostigma; dose $\frac{1}{4}$ to 1 grain.

Tincture of Physostigma; dose 15 to 45 minims.

Eserine Salicylate (Physostigminæ Salicylas); dose $\frac{1}{60}$ to $\frac{1}{20}$ of a grain.

Eserine Sulphate (Physostigminæ Sulphas); dose $\frac{1}{60}$ to $\frac{1}{20}$ of a grain.

PICRIC ACID

Picric acid is a yellow crystalline powder.

When applied locally it checks the growth of bacteria (antiseptic) and contracts the skin and mucous membranes. It is used in the form of wet dressings on burns and other wounds and occasionally as douches. It is often applied in the form of an ointment.

In large doses it is absorbed from the skin and causes the following poisonous symptoms: a yellow color of the skin and mucous membranes; the urine is also intensely yellow in color. It occasionally causes convulsions and collapse.

PILLS

Pills are drugs molded in the form of a very small sphere. They should always be fresh, for when they are exposed to the air they may become so hard that they

PILOCARPINE

cannot be dissolved by the juices of the stomach or intestines, and will then produce no effects.

And see CATHARTIC PILLS.

PILOCARPINE

See PILOCARPUS.

PILOCARPUS (JABORANDI)

Pilocarpus or **jaborandi** is obtained from the leaves of the **Pilocarpus jaborandi**, or **Pilocarpus microphyllus**, a Brazilian shrub. Its active principle is an alkaloid, **pilocarpine**. The preparations of pilocarpine, the alkaloid, are principally used.

Appearance of the Patient

About five to fifteen minutes after a dose of pilocarpine is given, the patient sweats profusely, there is a profuse flow of saliva, of tears, and of mucus from the nose, mouth and bronchi. The face is flushed, the pupils are contracted, and there is difficulty in seeing distant objects. The breathing is faster, and the pulse is somewhat more rapid and weaker. Later there may be diarrhea.

Local action: Applied to the skin, pilocarpine produces no effects, but it is readily absorbed from such local applications. It frequently increases the growth of hair on the scalp, whether it is applied locally or given internally. This is probably due to the increase in the secretions of the scalp. The hair is usually lighter in color and grows in patches.

Internal action.—In the mouth: Pilocarpine has a bitter taste.

In the stomach: It increases the secretion of the mucous membrane, and greatly increases the peristalsis of the stomach. In large doses it often causes nausea and vomiting.

In the intestines: Pilocarpine increases the secretion of the mucous membrane and the peristaltic contractions of the muscle wall. Frequent movements of the bowels therefore often result.

Dangers in the Use of Pilocarpine

Pilocarpine is a very efficient drug; but its use is limited by some of the following effects, which are often injurious to the patient:

1. The slow and weak pulse.

2. The profuse secretion of mucus in the bronchi fills up the lungs with mucus, and the contractions of the involuntary muscles of bronchi make them narrower. The mucus is then expelled with difficulty, and the lungs fill up with fluid. This condition is known as **edema of the lungs**. The patient is then said to “drown” in his own sweat.

PIPERAZINE

3. Patients often feel very weak and chilly after pilocarpine.

Poisonous Effects

Since pilocarpine is rapidly excreted, only acute poisoning occurs, usually from an overdose.

Symptoms.—1. Great weakness.

2. Profuse secretion of saliva.

3. Profuse perspiration and flow of tears.

4. Occasionally, nausea, vomiting, abdominal pain and profuse diarrhea, with watery stools.

5. Slow, irregular, weak pulse.

6. Rapid, difficult breathing, accompanied by “râles.”

7. Contracted pupils.

8. Occasionally, dizziness, slight delirium, and twitchings of the muscles.

The breathing finally becomes slow and shallow, the patient complains of great weakness, and death results from failure of the respiration. Consciousness remains to the end.

Treatment.—1. Atropine is given as an antidote. This paralyzes the nerve endings, which have been made more active by pilocarpine, and neutralizes its effects.

2. Give artificial respiration if the breathing is slow and shallow.

3. Heart stimulants such as caffeine or camphor are usually given.

Uses

1. Pilocarpine is used principally to increase the sweat; in cases of nephritis, when the patient secretes very little urine, and to remove fluid from the tissues. To avoid unpleasant effects from pilocarpine, the patient should be wrapped up in blankets and kept warm.

2. It is often used as a hair tonic, by local applications.

3. It is often given to overcome dizziness resulting from lessened secretion in the labyrinth of the ear.

Preparations

Fluidextract of Pilocarpus; dose 8 to 30 minims.

Pilocarpine Hydrochloride; dose $\frac{1}{20}$ to $\frac{1}{2}$ of a grain.

Pilocarpine Nitrate; dose $\frac{1}{20}$ to $\frac{1}{2}$ of a grain.

PINKROOT

See SPIGELIA.

PIPERAZINE

Piperazine is a chemical substance which is frequently used to relieve gout, and to dissolve stones in the kidney and bladder. Its use is based upon the fact that it dissolves uric acid crystals, when added to them in a test tube.

PIPSISSEWA

Practical experience in the use of this drug has not borne out this effect on the patient. It slightly increases the flow of urine, however.

Preparations

Piperazine; dose 5 to 10 grains.

Sidonal or Piperazine Quinnate; dose 15 to 20 grains.

PIPSISSEWA

See CHIMAPHILA.

PITCH

See TAR.

PITUITARY EXTRACT (PITUITRIN)

Pituitary extract is a substance made from the pituitary gland of the ox.

The posterior lobe of this gland secretes a substance into the blood which contracts the blood vessels and the uterus.

Disturbed secretion of this lobe produces a peculiar group of symptoms, such as the change in some of the sexual characteristics of the individual. (Hypopituitarism.)

Disturbed secretion of the anterior lobe causes enlargements of the hands and features, a condition known as **acromegaly**.

The following are the principal effects of pituitary extract; they are similar to those of epinephrin.

1. Pituitary extract makes the heart beat slower and stronger by directly affecting the heart muscle.

2. It makes the blood vessels narrower by contracting the small muscle fibers in their walls. It therefore greatly increases the blood pressure. This effect appears slowly but is more prolonged than that of epinephrin. The blood vessels of the kidney are the only ones that are dilated.

3. It increases the contractions of the uterus.

It is used to check bleeding from the uterus and to cause uterine contractions after labor.

Preparations

Desiccated Pituitary Substance (anterior lobe; dose 1 to 5 grams.

This is used in the treatment of acromegaly.

Desiccated Pituitary gland (posterior lobe); dose 1 to 5 grains.

This is used in the treatment of hypopituitarism.

Pituitary Body Desiccated; dose 1 to 5 grains.

Pituitary Extract; dose 5 to 15 minims.

Pituitrin; dose 5 to 15 minims.

PLACENTA

These substances are used to increase uterine contractions and to increase the blood pressure.

See EPINEPHRIN.

PITUITARY GLAND, DISEASES OF

The pituitary gland is composed of an anterior and posterior lobe. It rests in the sella turcica of the sphenoid bone. The function of the pituitary gland is probably concerned with growth. Too much secretion or *hyperpituitarism* is a condition, which, if it occurs before the ossification of the epiphyses, leads to gigantism, and, when it occurs later, after the bones have become full grown, is responsible for acromegaly. Too little secretion of the pituitary body (*hypopituitarism*) in a growing child leads to increased fat deposition in the tissues, dwarfism, and poor development of the sexual organs. When this occurs in the adult it leads to adiposity and sexual retrogression.

Probably the cases which interest us most from the surgical standpoint are those in which the pituitary gland is enlarged, with the result that the patient complains of severe headaches, and a beginning blindness. This is often seen in the late stages of acromegaly, a condition in which there is a progressive increase in the size of the hands, feet, head, jaw, and the tissues about the face.

Treatment.—Surgery endeavors to remove part of the pituitary gland. This may be done either by removing part of the body of the sphenoid bone via the nasal route, or by the subtemporal path. There is no special nursing entailed.

PITUITRIN

See PITUITARY EXTRACT.

PIX LIQUIDA

See TAR.

PLACENTA

The placenta at term is a roundish, flat organ, about nine inches in diameter, and three-quarters of an inch in thickness at the center. It becomes thinner at the edges where it passes with direct continuity into the chorion l ave. The umbilical cord is usually inserted towards, but rarely exactly at, the center of the fetal surface. This surface is covered with amnion, a smooth, shining membrane that can be stripped off up to the insertion of the umbilical cord. Below it is the somewhat roughened surface of the chorion, with the branches of the umbilical vessels. The maternal surface is dark and fleshy in appearance, and divided into several "cotyledons." The placenta generally weighs about one-

PLACENTA

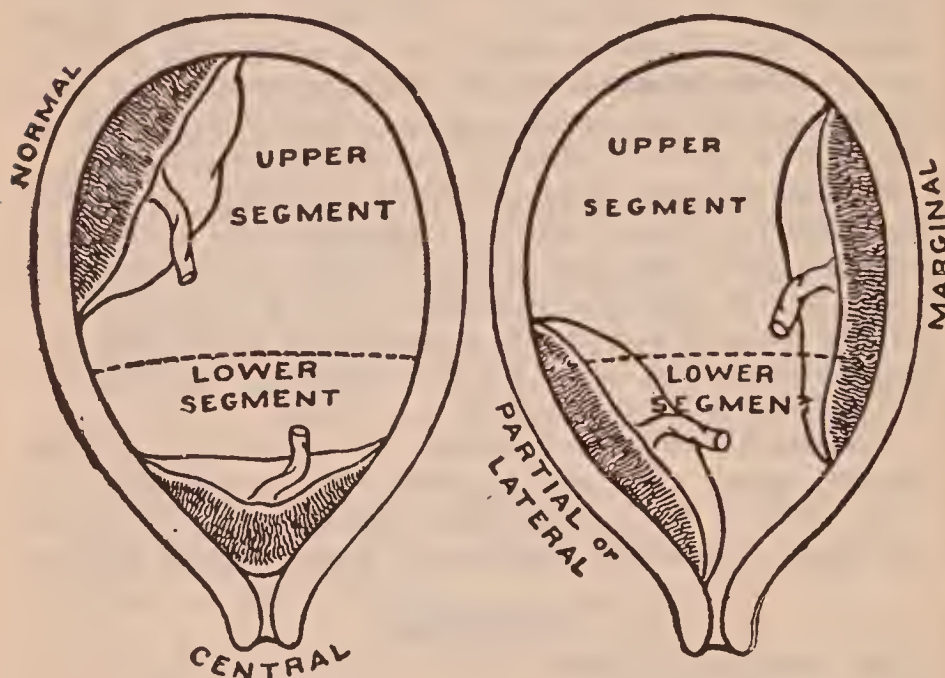
sixth of the bodyweight of the fetus—usually a little over a pound.

PLACENTA, DELIVERY OF

See LABOR, MANAGEMENT OF.

PLACENTA PRÆVIA

A *Placenta Prævia* is one which is situated either in whole or in part upon the lower uterine segment. A placenta that completely covers the internal os is called a *central placenta prævia*; one whose edge partly overlaps the os is



Normal and Morbid Situations of the Placenta. Morbid Situations of the Placenta.

(From Johnstone's Textbook of Midwifery)

distinguished as a *partial* or *lateral* placenta prævia; while one that is situated mostly on the upper uterine segment, but overlaps at its lower edge into the lower uterine segment, is called a *marginal* placenta prævia.

Placenta prævia is most commonly found in multiparæ, and frequently there is a history of previous endometritis.

A placenta prævia is but rarely normal in other respects. It is usually larger than normal, and thinner, and the cord is often inserted abnormally.

Frequency.—Happily the condition is rare. Among hospital patients its frequency is about 1 in 250, but in private practice it falls to 1 in 1000. The marginal variety is the commonest, the central the rarest.

PLACENTA PRÆVIA

Symptom.—The one and only symptom is hemorrhage, which comes on with no apparent cause. It is rare for this bleeding to occur before the seventh month of pregnancy, but thereafter its frequency increases as the gestation proceeds. The severity of the bleeding varies greatly. In some cases the first onset may be so serious as to endanger the patient's life. More often the first hemorrhage is slight, and ceases spontaneously, but is followed by recurrence after several hours or days. The hemorrhage may come on at any time, during sleep for example, and is in most cases not connected with any exertion or trauma.

The presence of the placenta in the lower pole of the uterus is associated with a tendency to malpresentation. Pelvic presentations, and more particularly transverse lies of the fetus, are considerably more frequent.

The occurrence of the hemorrhage is usually followed by the onset of labor. The labor is thus in many cases premature, a fact which accounts to some extent for the high fetal mortality.

Diagnosis.—Every hemorrhage occurring in the last three months of pregnancy is to be regarded as probably due to a placenta prævia until and unless that condition can be excluded. The exact diagnosis is made by feeling the placenta. In the majority of cases the os is sufficiently open to allow one or even two fingers to be introduced, and the soft mass of the placenta can be felt. In lateral placenta prævia the edge of the organ may be felt, and the finger even passed over it so as to feel the vessels worming their way over the fetal surface. The placenta may be distinguished from a blood-clot by the fact that a clot is easily broken up by the fingers, while the placental substance is more solid. At the same time the cervix is softer than usual, and there is an increased pulsation in the fornices, indicating greater vascularity. The presenting part is not easily felt, the boggy mass of the placenta intervening between it and the finger.

Treatment.—The aims of treatment are to control hemorrhage, and promote delivery.

Palliation should not be attempted unless the patient is in a position to be constantly watched, and instantly treated when the bleeding recurs.

Active treatment varies according to the condition of the cervix, and may conveniently be taken up in three divisions:

(1) When the os is closed.

(2) When the os admits two fingers.

(3) When the os is fully (or almost fully) dilated.

When the os is closed.—This, fortunately, is but rarely the case. When it does occur, the best treatment is to

PLACENTA PRÆVIA

pack the vagina and apply a binder and perineal bandage. The pressure of the packing compresses the placental site against the placenta, and so controls bleeding, while at the same time the uterus is reflexly stimulated to contractions which lead to dilatation of the os. The objection to vaginal packing is that it causes an accumulation of blood and secretions behind the pack, and these are apt to be infected unless strict asepsis is observed. The pack should therefore never be left in a moment longer than is absolutely necessary. On its removal one hopes to find the cervix sufficiently dilated to admit two or more fingers.

When the os admits two fingers (either as the result of previous packing, or when first examined).—In the majority of cases of hemorrhage the cervix is found so dilatable that two fingers can be passed through it. In these circumstances there are two methods of treatment open—either podalic version, or the use of Champetier de Ribes' bag.

When the os is almost fully dilated.—In these cases labor is going on, and it usually suffices to rupture the membranes. If the bleeding continues the dilatation of the os should be aided by the fingers and forceps applied as soon as possible, or else internal version performed.

Other forms of treatment that have been tried are the various methods of *accouchement forcé*. It is most important, however, to remember the increased vascularity of the cervix in these cases, which renders any form of forcible dilatation extremely dangerous. Many women have died from the hemorrhage due to tears of the cervix caused by well-intentioned efforts at delivery, who would have survived the bleeding due to the placenta prævia.

As soon as the child is born, the placenta should be removed manually unless the bleeding has stopped. Every effort must then be made to prevent post partum hemorrhage, which is peculiarly apt to follow. Among other reasons for this are the frequency of cervical tears, the frequently large placental site, and the fact that the lower uterine segment has not, from its structure, the same power of retracting and sealing up the blood-vessels as is possessed by the upper segment.

Prognosis.—The maternal mortality varies from 1 to 40 per cent. according to the variety of placenta prævia, the method of treatment adopted, and the state of the patient when first seen. The central variety is the most dangerous, the marginal the least so. Women who are exhausted by repeated smaller hemorrhages, before a serious hemorrhage forces them to seek advice, have obviously less chance of surviving. The fetal mortality varies from about 40 to 60 per cent., death being due to premature separation of the

PNEUMONIA

placenta, to the methods of interference in favor of the mother, and to such complications as prolapse of the cord, malpresentation, etc.

PLACENTA, RETAINED

See LABOR, MANAGEMENT OF; and RETAINED PLACENTA.

PLASTERS

Plasters are preparations which are made up with resins, wax or lead plaster, and spread upon coarse muslin or white leather. They are applied to the skin, the mixture of the drugs which they contain is dissolved by the heat of the body, and the drugs are then absorbed.

PLASTER OF PARIS

See BANDAGES.

PLEURA

See LUNGS.

PLUMBUM

See LEAD.

PNEUMONIA

Pneumonia is one of the diseases in which the nursing care is perhaps the most important factor. It must run its course, but skilled nursing care can do much to give comfort and prevent complications.

Pneumonia is an acute infection of the lungs and is the most fatal of all the acute diseases. It is called lobar or bronchopneumonia, according to the location of the pathological process in the lungs. The general principles of the treatment are the same in both conditions.

Bronchopneumonia is more apt to attack the weak, infants, and old people, in whom the power of heat production is very low. It is also more apt to be accompanied by acute bronchitis in which cold air may be irritating and may increase the cough. The treatment must be modified in these conditions. Cold air treatment may be too severe.

The *general principles in the nursing care and treatment* are much the same as in typhoid fever. *Rest* is absolutely essential. The patient must be spared every effort which means extra strain on the heart so that he may muster all his forces to combat the disease. Sudden movements are particularly to be avoided. He should be kept in the recumbent position with one pillow only, unless difficulty in breathing makes this position impossible. When in the semi-recumbent or sitting position he must be comfortably supported, prevented from sliding down and all causes of strain removed. He should be turned frequently, but never

PNEUMONIA

allowed to turn himself. Mental rest and quiet are equally essential; the patient knows he is ill, does not want to be disturbed, has enough on his mind, his attention being concentrated on the struggle to get enough air.

The *General Hygienic Care*.—The choice and management of the room, the bed, care of the body, prevention of bed-sores, and the care of the eyes, nose and mouth—are the same as and equally essential with those in typhoid fever. The care of the nose, back of the nose and mouth is particularly important.

The *diet* varies with the length of the disease and the degree of toxemia. In lobar pneumonia, the patient is usually very toxic. The appetite is poor, digestion is impaired, and the course is very short, so that no attempt is made to force the diet. Fluid diet is given. Milk or its substitutes are the chief foods. *Water* is given in abundance and lemonade, orangeade, and imperial drink for the same purpose as in typhoid. When lobar pneumonia is prolonged or when complications set in, also in bronchopneumonia, which is more prolonged, efforts are made to increase the caloric value of the diet.

The *elimination of waste materials* is extremely important. Elimination by the skin, kidneys, lungs and intestines is stimulated by cleansing baths, cold air or cold baths, abundance of water to drink, and drugs which stimulate the circulation or promote the action of the skin, kidneys or intestines.

The *symptoms* to be relieved are pain, cough, fever, headache, delirium, restlessness and sleeplessness, dyspnea, and cyanosis. The *complications* to be feared and treated if present are pleurisy (always present in lobar pneumonia), empyema, bronchitis, myocardial insufficiency, or vasomotor paralysis and pulmonary edema.

The *treatments* consist in the application of cold, of heat, and other counterirritants, rest, position, and the administration of drugs.

Cold is applied in the form of *cold air*, the *cold chest compress*, an *ice cap*, and *cold baths*.

The *Open-air Treatment*.—In pneumonia, the beneficial effects of cold, open air are particularly valuable. Only the face should be exposed. The patient should wear a hood and be carefully protected from winds and drafts. The extremities and body, particularly the shoulders, should be kept snug and warm with extra clothing and a hot water bottle at the feet.

Cold Baths.—The cold sponge and cold pack are used to reduce the fever when very high and prolonged, to relieve toxemia and restore the vital centers.

PNEUMONIA

Heat sometimes gives more comfort and relief. Local applications are made to the chest. Steam inhalations give great relief in coughing due to bronchitis. Warm sponge baths sometimes relieve restlessness and sleeplessness.

Other *counterirritants*—a mustard paste or drp cupping—are also used for the relief of pain, coughing and dyspnea.

Strapping the chest with adhesive rests the lung, prevents friction and relieves pain and cough due to pleurisy.

Venesection is sometimes performed to relieve cyanosis and dyspnea in strong, full-blooded patients, when the livid, bloated face and full, bounding pulse indicate venous congestion.

Drugs.—Codeine and morphine are sometimes given to relieve pain and coughing. They are also given to relieve headache, delirium, sleeplessness and restlessness. Bromides veronal, trional, and paraldehyde are also used for sleeplessness and restlessness—sleep is absolutely essential. Heart stimulants—caffeine, camphor, strychnine, adrenalin—and respiratory stimulants—caffeine, atropine, etc.—are given as required.

The *crisis* in pneumonia, as the name suggests, is a very critical period due to the sudden drop in temperature, loss of heat, profuse perspiration and relief of strain on the heart. Marked depression and collapse may occur with a weak, rapid pulse, subnormal temperature, cyanosis and cold, clammy sweat. The patient should be watched very closely when the crisis is due (which may be about the seventh or ninth day) and the nurse should help him through with careful nursing, by the application of external heat, by rubbing the extremities, etc., with warm alcohol to improve the peripheral circulation and by giving heart and respiratory stimulants as ordered.

Patients with an alcoholic history require particular watchfulness on the part of the nurse throughout the disease. They are more apt to suffer from heart failure and nervous symptoms and may develop delirium tremens. They are always thirsty and should be given abundance of water to drink. Water, nourishing diet, alcohol, and sedatives help to prevent extreme nervous symptoms.

During *convalescence* the patient must not be allowed to sit up or allowed any unusual exertion without special orders from the doctor, because of the danger of sudden death from *failure of the weakened heart muscle*. When allowed to sit up the pulse must be closely watched. Sudden death from *pulmonary embolism* is also to be feared, because during convalescence resolution is taking place.

Prophylaxis.—Nurses in caring for pneumonia patients should take particular care of their own health. They should

PNEUMONIA (POST-OPERATIVE)

be well nourished, take the proper amount of exercise, and should avoid fatigue, exposure, mental worry, common colds or anything likely to lower their resistance. The nose and mouth should be cleansed with an antiseptic frequently. Care should be taken to avoid the excretions from the nose and throat when the patient is coughing or sneezing, also care should be observed when handling these secretions and sputum. When open-air treatment is used, the nurse should be warmly clad.

Pneumonia in Children.—Bronchopneumonia comprises 75 per cent. of all the pneumonia in the first year. It is always very serious, although the outlook is better than in adults. Lobar pneumonia comprises nearly all the cases of primary pneumonia.

The *nursing care* is much the same as in adults. When cold-air treatment is used, extreme care must be taken to protect from winds and drafts, and to see that the body and extremities are warm. Cold air is not used when bronchitis is present. When sponging young or feeble infants for fever, etc., extreme care should be taken to avoid exposure and chilling, as their powers of heat-production and of reaction are very poor. Frequent change of position is necessary; a young child may be held in the arms of the nurse. Circulatory failure is much less a cause for worry than in adults. Nervous symptoms—delirium, convulsions—may be marked.

PNEUMONIA (POST-OPERATIVE)

This is one of the most serious of post-operative complications; and while it cannot be absolutely obviated there can be a marked diminution in its frequency if greater attention is paid to the smaller details of ante-operative and post-operative care.

In hospital work and in private nursing the fact is often forgotten that the patient in his home has been accustomed to certain clothing and has been living for years under peculiar hygienic conditions. Upon entering the hospital he is given an abbreviated nightgown and placed in a bed with one or two blankets. When he is physically examined his gown is taken off, and very often there is a draught from a nearby open window. The deep breathing and coughing incident to the auscultation of the lungs often cause a perspiration, and the cool air on the heated skin is a poor combination. Occasionally the patient is asked to get out of bed and stand up, his bare feet very often resting against the cold floor; or often, when the abdomen is shaved and being prepared for operation, the patient is unduly exposed. Then from a warm bed he is placed upon a cold stretcher,

PNEUMONIA (POST-OPERATIVE)

wheeled through draughty, chilly halls, and plunged into a super-heated operating room. During the operation he is apt to perspire freely, and while it is routine to change a drenched gown, the patient, through neglect, is often permitted to keep it, and in this condition he is sent through the halls again, back into the ward. During the recovery period, he may toss around, uncovering his body, and exposing his depressed system to more draughts, more chilling, opening the way to a pneumonia. When the matter is given thought, the real wonder is that pneumonia is not more frequent. The best method of treating this serious complication is by prophylaxis. Prevention is better than cure, and careful and conscientious surgical nursing will greatly aid in diminishing the incidence of this dreaded complication.

Prophylactic Treatment.—Ante-operative.—All patients before operation should be carefully examined for coryza, bronchitis, pharyngitis, or tonsillitis, and if any of these exist, the operation should not be performed, but temporarily postponed. Of course, acute cases fall into another category, and very often it is advisable to do these under local anesthesia rather than run the risk of ether or gas administration which is sure to spread the infection into the lungs. If the nurse at any time prior to operation notices that the patient sneezes excessively, or that signs of a cold are developing, it is imperative that she immediately notify the surgeon, for few will operate when there is even the slightest infection of the respiratory system.

When patients are being examined physically, or receiving treatments, it is highly important that all windows and doors in the vicinity be closed and that draughts be diminished to the minimum. If a patient has to leave the bed he should be adequately supplied with slippers, a bathrobe, and, if necessary, a blanket. When he is moved to and from the operating room he should be warmly covered, and in the operating room the same general rules hold true. If his gown becomes wet with perspiration, his body should be thoroughly dried and a new gown supplied.

Operative Prophylactic Treatment.—While the patient is recovering from the anesthetic, the lower jaw should be held firmly and pressed forward, exerting pressure at both angles; this will do much to prevent gagging, and when the patient vomits the head should be turned to one side, the jaw still being held, and the vomitus caught in a pus basin. It is highly important that this be always done, because if this procedure is routinely and regularly followed, the danger of the vomitus being aspirated into the lungs is reduced. Aspiration is not an uncommon cause of pneumonia.

PNEUMONIA (POST-OPERATIVE)

Post-operative Prophylactic Treatment.—When the patient arrives in the ward or room, he should be warmly covered and very often, in order to maintain a good body heat, the bed may be previously warmed either with electric pad or hot water bottles. If the patient tosses about, the blankets should always be readjusted. If there is a tendency to vomit the jaw should be held firmly forward and the head turned to one side.

Treatment of Post-operative Pneumonia.—The treatment is really that of any lobar pneumonia. The patient is usually on a Gatch bed. The Gatch bed is one which is made in sections so that the upper portion of the body may be elevated and the knees flexed by adjusting these sections to any desired degree.

The windows are opened wide and as much fresh air is given as possible. The diet is liquid, including milk. Fluids should be forced to about 3,000 c.c. a day, and the intake and output should be accurately measured.

Abdominal distention is always looked for and treated immediately with rectal tube, enemas or colon irrigations.

The cough is particularly distressing and dangerous, for after a surgical operation the pressure caused by straining may break some of the sutures, and sometimes the abdominal wound is ruptured wide open, and the abdominal contents protruded. To prevent this horrible complication a good, tight, well-placed binder is exceedingly important, for it gives added support to the abdominal wall. If the coughing is very severe, the nurse should support the lateral areas of the abdominal wall with her hands. Should evisceration take place, the intestines should be covered with sterile towels, and the surgeon immediately summoned. For the cough, doctors will prescribe a codeine cough mixture, or leave orders for codeine to be given either by mouth or hypodermatically.

As soon as the diagnosis is made, it is routine to administer tincture of digitalis as a cardiac stimulant, the dose being 10 to 15 minims three times a day. If the pulse is very rapid, and the heart overacting, it is controlled by an ice bag placed over the precordium.

Pleural pain, which is very distressing, yields to strapping the affected side with adhesive plaster.

Pneumonia cases must always be watched carefully for cardiac failure, and edema of the lungs. The cardiac failure is evidenced by a weak, thready pulse, cyanosis and respiratory difficulty. Edema of the lungs manifests itself by bubbling respirations.

Cardiac failure is treated by stimulants, such as camphor in oil, caffeine or atropine. Edema of the lungs responds

POISONING

best to good dry cupping especially applied to the posterior regions of the chest. This should be done for about twenty minutes at a time. Great care should always be exercised in preventing the patient from being burned with the cups. The use of oxygen in these cases with the present apparatus is practically useless.

PODOPHYLLIN

See PODOPHYLLUM.

PODOPHYLLUM

Podophyllum is the underground root and rootlets of the **Podophyllum peltatum**, the May apple or mandrake, a perennial plant growing in Northern and Middle United States. Its active principle is a resin, podophyllin. It also contains an alkaloid, berberine.

Action

Podophyllum causes frequent, copious, bile-stained stools about eight to twelve hours after it is given. This is the result of its action on the duodenum. Since the bile ducts are attached to this part of the intestine, the flow of bile is also increased, and the stools are therefore stained with bile.

In poisonous doses the frequent stools may cause great exhaustion and collapse.

Preparations

Resin of Podophyllum; dose $\frac{1}{4}$ to 1 grain.

Pills of Podophyllum, Belladonna, and Capsicum; dose 1 pill.

Podophyllin; dose $\frac{1}{20}$ to $\frac{1}{2}$ of a grain.

POISONING

Accidental poisoning, which may be caused in various ways, needs generally the most immediate attention to save life. These accidents are often caused by pure carelessness in the giving or taking of medicine in the dark or without looking carefully at the label, or by leaving dangerous drugs within the reach of children.

Immediate treatment.—When any one is poisoned, and you are not sure of the antidote, do not hesitate a moment, but give an emetic of some kind while awaiting the arrival of the doctor. Mustard and salt will be found in every household, and are very effective. For an adult give a teaspoonful of mustard or salt to every glass of lukewarm water. Make the patient drink two or three glasses, no matter how he objects, and then by tickling the throat with the finger, the irritation will cause vomiting. Repeat in ten minutes so that the stomach will be thoroughly emptied. In case of children give ipecac instead of mustard and water.

POLIOMYELITIS

When there is any delay in getting the mustard or salt, use plain, lukewarm water in large quantities. After the stomach is thoroughly emptied, give an enema if the doctor has not arrived. When the poisoning is caused by canned goods or stale fish, give a large dose of castor oil as soon as the vomiting ceases. There are various antidotes to be used according to the poison that has been taken, and it is well to have a list of them on hand.

Antidotes for poisons.—For *Acid Poisons*, such as Carbolic Acid, Nitric Acid, Oxalic Acid, give two or three glasses of milk and lime-water; no oil of any kind, as it would only help to dissolve the acid. Do not give emetics, as the acid would a second time tear the tissue of the throat, during vomiting.

For *Irritant Poisons*, such as Tartar Emetic, Arsenic, Paris Green, Rough on Rats, Iodine, Iron, Lead, Mercury: First give an emetic; then give plenty of milk, white of egg, or flour and water.

For *Alkaline Poisons*, such as Ammonia, Lime, Saltpeter: After an emetic, give lemon juice or vinegar, followed by castor oil.

For *Narcotic Poisons* the treatment is as follows:

Aconite: Emetic, then stimulants and hot applications.

Belladonna: Emetics, artificial respiration, heat, hot mustard baths.

Alcohol: Emetics, cold to the head, and heat to the feet.

Digitalis: Emetics and a dose of strychnine; keep the patient quiet.

Opium: Emetics, strong black coffee by mouth and rectum, and active exercise. Patient must be kept awake.

In all poison cases give plenty of hot water to drink, as it flushes out the system (as much as three quarts is sometimes used), and keep up the treatment without intermission, no matter what objection the patient may make.

Care is needed for the first few days after poison has been in the system, especially in regard to diet, which should be very simple.

Poison from ivy.—In case of poison ivy, a wet dressing of bicarbonate of soda well wrapped around the inflamed surface is the best treatment.

Poison from stings of insects.—Ammonia and water, salt and water, or bicarbonate of soda; any one of these remedies will remove the pain and swelling.

POLIOMYELITIS, ACUTE ANTERIOR

Poliomyelitis has a supposed incubation period of one to two weeks, a prodromal period of 0 to 7 days, and its typical symptom is paralysis of voluntary muscle somewhere;

POLLANTIN

one muscle, a group or several groups, anywhere in the body, depending on what particular nerve paths are involved in the central damage.

The prodromal symptoms may be those of a mild sore throat, of a slight digestive upset, or of a mild grip. Sometimes the patient has twitching or convulsive movements. Pain on movement, tender points and profuse sweating are often present.

The diagnosis can only be made with surety when paralysis develops.

Doubtless many light attacks pass unrecognized or even unnoticed, especially if they do not go as far as paralysis; these are known as abortive cases.

The germ is in dispute, although no doubt a germ is responsible and the poison has been demonstrated. Most outbreaks occur in hot weather, usually in dry, hot weather. We do not know much about its infectiveness, but it is supposed to be spread by mouth-spray and hands, thus moving from person to person until it reaches a susceptible one.

See CEREBROSPINAL MENINGITIS.

Nursing Care in Acute Anterior Poliomyelitis.—The important points in the nursing care of acute poliomyelitis are:

Absolute rest in bed with careful adjustment of the bed clothes to prevent pressure and resulting deformity. A cradle should be placed over the feet and legs.

A daily cleansing bath to keep the skin in good condition. Avoid pressure spots.

An easily digested diet and plenty of water.

Screen the patient from flies.

Isolate the patient and disinfect all excretions. Discharges from the nose and throat are probably of the most danger.

Never let patient sit up.

Shallow, rapid respirations indicate paralysis of chest muscles and should be reported to the physician at once.

Warm saline baths are frequently used when the tenderness becomes less acute.

For restless cases a Bradford frame is often used.

If splints are ordered they must be carefully and persistently applied.

Active treatment should not be started until after the acute stage (which is arbitrarily fixed at six weeks), unless the tenderness continues longer than this time.

POLLANTIN (DUNBAR'S SERUM)

This is the serum of horses that have been immunized against the pollen of common weeds or grasses which are

POMEGRANATE

believed to be the cause of hay fever. It is used in the treatment of hay fever and is given hypodermically or applied locally.

Pollen Vaccine: This is a watery extract of the pollen of various weeds and grasses such as ragweed, timothy, etc., which are believed to be the cause of hay fever. It is given hypodermically in gradually increasing doses as a preventive for the attacks of hay fever.

POMEGRANATE

See GRANATUM.

PORTER

See ALCOHOL.

PORT WINE

See ALCOHOL.

POSITIONS

The chief positions used in abdominal and pelvic examinations are the following:

The Horizontal Recumbent Position.—In this position the patient lies flat on her back with legs together and extended or slightly flexed to relax the abdominal muscles. One pillow only is allowed under the head. The arms may be crossed on the chest or lie loosely at the side of the body.

The Dorsal Recumbent Position.—This position resembles the above except that the legs are slightly separated, the thighs are flexed upon the body, and the legs upon the thighs so that the soles of the feet rest upon the bed. If the patient is placed on a special examining table the feet rest on the extensions provided for them, and the patient's buttocks are brought to the extreme edge of the table.

The Dorsal Elevated Position.—This position is the same as the above except that pillows are placed under the head and shoulders so as to further relax the abdominal muscles. This is sometimes necessary for a proper bimanual examination of the pelvic organs.

The Dorsal Lithotomy Position.—This position is the same as the dorsal recumbent except that the the legs are well separated and the thighs are acutely flexed on the abdomen and the legs on the thighs. The buttocks are brought to the extreme edge of the table or a little beyond. To maintain this position and further separate the legs upright rods with stirrups attached are fastened to the sides of the table, the legs are sharply flexed backward and each foot is passed to the outside of the rod and fastened in

POST-OPERATIVE COMPLICATIONS

the stirrup. A pillow or sandbag is sometimes placed under the hips to elevate the pelvis. The sandbag is better as it gives a firm, unyielding support.

Sims' or Left Lateral-Prone Position.—In this position the patient lies on her left side obliquely across the bed or table. One small pillow is arranged under the head so that the patient's left cheek rests comfortably upon it. Her buttocks are brought to the edge of the mattress. Her left arm is then drawn behind her back and her body inclined forward so that she lies partly on her chest. Her right arm lies in front in a comfortably flexed position. The thighs are flexed, the right one more so than the left. The knees are also flexed, the right more so than the left, so that it crosses the left and rests on the bed.

The Knee-chest or Genu-pectoral Position.—As the name implies, when in this position the patient rests on her knees and chest. The head is turned on one side with the cheek resting on a pillow. The arms should be extended, flexed at the elbows and resting on the bed so as to partially support the patient, or they may be clasped above her head. They are never allowed under her. The patient rests on her knees which are slightly separated. The legs are extended, the thighs being vertical and at right angles to them. A small pillow may be placed under the chest, but the abdomen remains unsupported. The abdomen is not allowed to rest against the flexed thighs, because the object of this position is to cause the pelvic organs to fall forward.

The Trendelenburg Position.—This position is not used in the ward for the purpose of examination. It is used in the operating room during operations on the pelvic organs in order to displace the intestines from the pelvis into the upper abdomen. A special table is necessary which can be adjusted so that the patient's head is low, her shoulders held by shoulder supports attached to the table, her body on an inclined plane and her knees flexed over the adjustable lower section of the table, which is lowered. The legs are fastened to this lower section to further prevent the patient from slipping.

POSITION OF FETUS

See PRESENTATION AND POSITION.

POST-OPERATIVE COMPLICATIONS

The most important of these are nausea, vomiting, pernicious vomiting, gastric dilatation, tympanites, auto-intoxication, post-operative pneumonia, pulmonary embolism, urinary retention, urinary suppression, phlebitis, and thrombosis. (See under each of these headings.)

POST PARTUM HEMORRHAGE

POST PARTUM HEMORRHAGE

Of all the serious complications of a confinement, post partum hemorrhage is at once the most common, the most full of possibilities of immediate disaster, and the most trying to the nerve and presence of mind of the accoucheur. A thorough understanding of the causes and treatment is of the first importance, because, happily, the prognosis is good in cases where the treatment is prompt and correct.

Definition.—Under the term post partum hemorrhage are included hemorrhage during the third stage—before the expulsion of the placenta—and hemorrhage in the first six hours following delivery. Strictly speaking, this is known as *primary* post partum hemorrhage, as opposed to *secondary* hemorrhage coming on during the puerperium and better known as *puerperal* hemorrhage.

Varieties.—It may be divided, from an etiological point of view, into two varieties:

(1) Atonic.

(2) Traumatic.

Atonic Post Partum Hemorrhage

is the more common variety, and it includes bleeding from several causes, all of which, however, are associated with imperfect contraction and retraction of the uterus.

Predisposing Causes

Multiparity—especially a rapid succession of pregnancies. The actual cause in these cases is probably the chronic metritis so commonly associated with them, the muscular tissue being in part replaced by fibrous tissue.

Debility, the result of chronic diseases, underfeeding, bad surroundings, etc.

Overdistention of the uterus, as in hydramnios, and twins.

Uterine fibroids.

Ante partum hemorrhage—placenta prævia, and accidental hemorrhage.

Malpresentations and malpositions of the fetus.

Pelvic contraction.

Other causes of *prolonged* or *obstructed* labor.

Primary uterine inertia.

Prolonged administration of chloroform.

Injudicious use of Scopolamine-morphine narcosis.

Diminished coagulability of the blood—*Hemophilia.*

Exciting Causes.—*Artificial Delivery during Secondary Uterine Inertia.*—This mistake may be said to be a direct invitation to disaster.

Mismanagement of the Third Stage.—The importance of keeping control of the uterus throughout the third stage has already been mentioned. Unnecessary massage is to be

POST PARTUM HEMORRHAGE

deprecated, but whenever the contour of the uterus grows vague, or its consistence threatens to become flabby, brisk massage is indicated. If the hand is kept on the fundus there is little possibility of the uterus filling with blood without the obstetrician's knowledge.

Incomplete Separation of Placenta or Membranes.—This interferes mechanically with the proper retraction of the uterus. Simple retention of the separated placenta, or portions of it, may have a similar effect, particularly where there is already a tendency to inertia.

Diagnosis.—This is a simple matter when the blood suddenly gushes from a flabby uterus. More commonly, however, all that is visible is a continued ooze of blood from the vagina, which soaks into the bedding, and so may escape notice for some time. In these cases the soft uterus may have meantime been filling up with blood, and when the fundus is grasped and compressed, a large quantity of blood is expressed. According to the amount of blood lost, there is more or less collapse of the patient, with a small, rapid pulse, and all the other symptoms of hemorrhage—pallor, faintness, restlessness, etc.

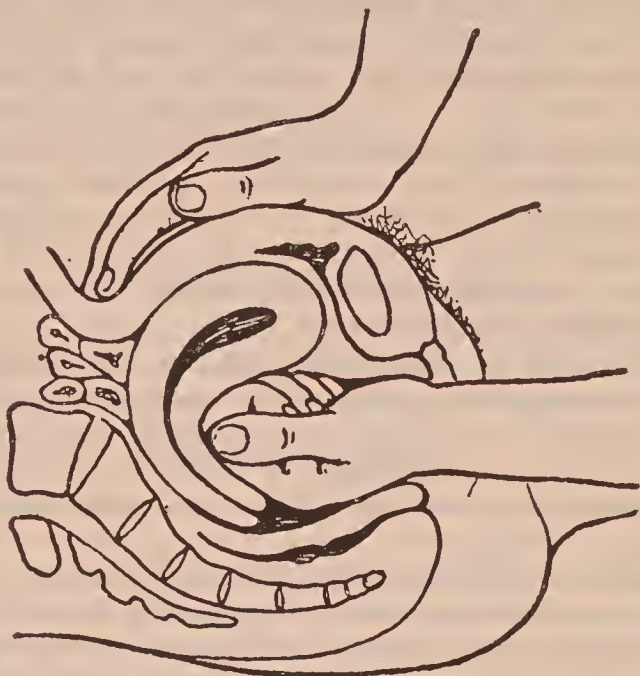
The first type of case, where the blood suddenly gushes out like water from a hydrant, is much the more serious. If not instantly treated, the patient may be dead within two or three minutes. Fortunately a wider knowledge of the correct conduct of the third stage has made this type of case rare.

Treatment.—In normal labor the separation and expulsion of the placenta are very often accompanied by the loss of a few ounces of blood, and it is hopeless and valueless to attempt to state in actual figures what constitutes a post partum hemorrhage and what is still within the limits of normal. The loss of blood is to be measured, not in ounces or drams, but by its effects on the patient, for a hemorrhage that does little harm to one woman may easily prove fatal to another.

Every case of post partum hemorrhage demands instant treatment. There is no time to cogitate as to what is to be done. It is necessary, therefore, to have in mind some routine of practice, and to understand the principles upon which it is based. Treatment is aimed at stimulating the inert uterus to retract properly; at removing anything inside it which may be preventing this; and thirdly, at mechanically preventing the escape of blood, until such time as the uterus may have recovered its normal powers. The following methods may be employed consecutively. Slight cases will yield to the simpler measures; severe ones may call for more drastic measures.

POST PARTUM HEMORRHAGE

(1) *Grasp the fundus* firmly between the fingers and thumb, massage it, and knead it until it becomes firm and definite in outline. If the placenta is still inside it, express it by Crede's method, along with any blood-clot that happens to be in the uterus. If in *more serious* cases the attempt to express the placenta fail, the hand must be passed into the uterus and the placenta or blood-clots removed manually. This indicates the desirability of always keeping the right hand as far as possible aseptic during a labor. Unless competent assistants are present there is no time to put on a glove, still less to resterilize the hand.



Bimanual Compression.

(From Johnstone's Textbook of Midwifery)

(2) Meantime the nurse should be preparing a hypodermic injection of *ergotin* or *pituitary extract*. Where there is reason to fear or anticipate hemorrhage this should be prepared beforehand, and be ready for use the moment the placenta has been removed. Pituitary extract is the most active drug known for stimulating uterine contractions. Some of the ergot preparations are, however, not far behind it—particularly “Ernutin” and “Aseptic Ergot”—and their effect is perhaps more lasting. All these drugs are supplied in small glass capsules, sterilized, and ready for instant use. The injection is best made deep into the buttock. The fluid extract of ergot may be given by the mouth in doses of one to two drams, but it is slow in action, and rather apt to make the patient sick.

POST PARTUM HEMORRHAGE

(3) *Hot water* at a temperature of 115° to 120° Fahr. is a potent uterine stimulant. Ice-cold water has a similar though less pronounced effect, but its use is contraindicated on account of the shock involved. The hot water is applied in the form of a douche—either plain sterile water, or weak lysol (1 dram to a pint). The douche is used vaginally in the first place, but if necessary it should be carried into the uterus, right up to the fundus, care being taken to provide by means of one finger alongside the douche nozzle a channel for the return of the fluid, or to use a two-way catheter.

These measures rarely fail to stimulate the uterus to contraction; but if they do fail, the case becomes more serious, and more drastic methods of treatment must be employed.

(4) *Compression of the uterus* between the two hands may control the hemorrhage for some time. The fingers of the one hand are passed into the vagina against the anterior fornix, while the hand on the fundus squeezes the uterus downwards on to them. If the vagina is roomy the entire closed fist may be passed into it. In some cases the closed fist may even be passed right into the uterus, which is then pressed down upon it by the hand on the abdomen. This is really equivalent to the next mode of treatment, namely—

(5) *Packing the Uterus*.—If this is carefully done, it absolutely controls the hemorrhage. Broad sterilized gauze is the best material to use, but anything else suitable may be used, provided it is sterile. The cervix should be grasped by a volsellum and drawn down to the vulva, and the gauze passed in by the hand or a pair of long forceps. After packing the uterus, pack the vagina, and apply a firm binder over the fundus.

The use of styptics, such as perchloride of iron or vinegar, is worse than useless, as to produce any effect they must be applied in such quantity and strength that they cause sloughing of the entire endometrium.

Traumatic Post Partum Hemorrhage

This is bleeding from tears and other injuries of the genital tract caused during labor. Serious hemorrhage may occur from tears of the cervix if they extend into the base of the broad ligament, or if the placenta has been situated on the lower uterine segment.

Tears of the vaginal wall and the anterior part of the vulva in the neighborhood of the clitoris may cause very free bleeding. Perineal tears do not, as a rule, cause much bleeding.

Diagnosis.—This is made, generally in the course of treating the hemorrhage as presumably due to inertia of the

POST PARTUM HEMORRHAGE

uterus, by noticing that the bleeding continues in spite of the fact that the uterus is quite hard and contracted. Careful visual and manual exploration must be made to locate the site of the hemorrhage.

Treatment.—Tears of the vulva and vaginal walls should be secured by stitches. Cervical tears may also be stitched after the cervix has been drawn down by a volsellum. A speculum and a good light are necessary. The alternative is to pack the tear with gauze, and even this is by no means easy unless a speculum and a good light are available.

Treatment of Collapse after Hemorrhage.—The treatment of the collapse after a serious hemorrhage is almost as important as the arrest of the bleeding. It is essential to replace the fluid that the body has lost, and even a momentary anemia of the vital centers in the medulla is to be avoided. The head must be kept low, the foot of the bed raised, and the blood that is in the body conserved for the use of the brain and other vital organs by firm bandaging of the limbs from below upwards.

The restoration of fluid to the system is best carried out by the injection of large quantities of warm sterile saline solution (one dram to the pint). The most direct method is that of intravenous transfusion, but injection by a large cannula into the submammary tissue is easier and less risky in private practice. Easier still, and almost equally effective, are repeated slow injections into the rectum—two to three pints every three hours. The fluid must not be run in more quickly than about a pint every half-hour, or else it will not be retained and absorbed. Two or three drams of adrenalin or some pituitary extract may with advantage be added to the first rectal saline.

Cardiac stimulants may also be given, but not recklessly. Hot black coffee with two or three ounces of brandy may be given per rectum, if that channel is not being used for the administration of saline. Brandy or ether may be injected subcutaneously.

Recovery after serious hemorrhage is always tedious, and apt to be complicated by septic manifestations. It should not be hurried, as late complications such as “white leg” may arise.

Puerperal Hemorrhage (Secondary Post Partum Hemorrhage).—This may come on any time in the puerperium after the first six hours. In early cases it takes the form of excessive red lochia, in later cases of a sudden return of blood in the lochia. Most cases will be found to be due to the retention of portions of placenta or membranes, which may or may not have become septic; to subinvolution; or to displacements of the uterus.

POTASSIUM CHLORATE

Sudden alarming hemorrhages are due to the retention of considerable portions of placenta, such as a succenturiate lobule.

Continued hemorrhage coming on in the third or fourth week should not be allowed to pass without thorough investigation, as it may be due to chorion-epithelioma.

Treatment varies with the cause. Before exploring the uterus, the effect of large doses of ergot, hot vaginal douching, and rest should be tried. If these fail, the uterus must be explored, and any retained portions of placenta removed, or displacements remedied. Chorion-epithelioma can only be diagnosed after curettage, and calls for immediate hysterectomy.

POTASSIUM

See ALKALIES; IODIDES; SALINE DIURETICS, and SALINE PURGATIVES.

POTASSIUM CHLORATE

Potassium chlorate is a white crystalline powder having a cool salty taste. Its effects are due to the chlorate ion of the salt.

Applied to the skin or mucous membranes, potassium chlorate contracts the tissues and acts as an astringent. It is therefore used to relieve inflammation of ulcerated surfaces or mucous membranes. It is frequently used as a gargle for sore throat and for ulcerations of the mouth following mercury poisoning.

Potassium Chlorate Poisoning

This condition usually results when a potassium chlorate gargle is swallowed by mistake. The symptoms are due to the formation in the blood of methemoglobin, a form of hemoglobin which does not combine with oxygen; and the red corpuscles are then unable to carry oxygen to the tissues. At the same time potassium chlorate injures the kidneys, producing symptoms of nephritis.

Symptoms.—1. Abdominal pain.

2. Profuse vomiting and diarrhea (the vomited matter contains bile or blood).

3. Scanty urine, which may contain hemoglobin and methemoglobin (this gives the urine a transparent red color).

4. Jaundice, with small hemorrhages into the skin.

5. Cyanosis.

6. Muscular twitchings, convulsions.

7. Coma, collapse.

Treatment.—The treatment consists in washing out the stomach and giving heart stimulants. The condition is best

POTASSIUM NITRITE

relieved, however, by removing a quantity of blood from a vein (and thereby a quantity of the methemoglobin) and replacing it by an intravenous infusion of normal salt solution.

Preparations

Potassium Chlorate; dose 5 to 15 grains.

It is used in 4 to 6 per cent. solutions as a gargle.

Troches of Potassium Chlorate; each contains 5 grains.

Sodium Chlorate; dose 5 to 15 grains.

This has the same action as potassium chlorate.

POTASSIUM NITRITE

See NITRITES.

POTASSIUM PERMANGANATE

Potassium permanganate is a salt of manganese.

When potassium permanganate comes in contact with organic substances, such as the albumins of the tissues, it combines with the albumins and liberates oxygen, which destroys bacteria; acting as an antiseptic and disinfectant. When it has combined with the albumins, it no longer liberates oxygen and is therefore not effectual.

It is used in poison ivy rash. In India it is used for snake bite.

Preparations

Potassium Permanganate; dose 1 to 3 grains.

For the hands and wounds it is used in 1 to 3 per cent. solutions. It is also used as a gargle and for douches in 1 to 1000 to 1 per cent. solution.

Zinc Permanganate.

This acts like potassium permanganate and is principally used as an injection in gonorrhea.

POULTICE OR CATAPLASM

The **poultice** is an application of moist heat in the form of a soft paste which retains its heat for a varying length of time according to the ingredient used. The good effects of the poultice depend mainly upon the heat.

The *ingredients* commonly used are flaxseed or linseed, bread, hops and digitalis. Flaxseed is the best because of its mucilaginous and oily ingredients. It is more soothing to the skin, may be used at a higher temperature without burning, retains its heat longest, and air can be readily incorporated in it, making it light and more bearable to the patient.

The *effects* of the poultice are the same as those due to the fomentation and, like the fomentation, usually give the patient great relief and a sensation of comfort if properly

POULTICE

applied. If not properly applied it causes discomfort and may do harm.

Poultices are used for purposes similar to the fomentations, but are most commonly used as a therapeutic measure in the following conditions: (1) Pneumonia, to stimulate the absorption of the products of inflammation and congestion, and to relieve pain, dyspnea and cyanosis. (2) Pneumonia in post-operative cases to relieve distention. (3) Over painful, inflamed and infected wounds, and suppurating areas.

The Method of Procedure.—The important factors to consider in making and applying a flaxseed poultice in order to obtain the best results are:

1. The *temperature* of the poultice should be as hot as the patient can stand. It is tested with the back of the hand or by holding it to your cheek.

2. The *size* of the poultice should be large enough to completely cover the desired area.

3. The poultice should be light, thick enough to retain the heat, of the right consistency, perfectly smooth and even, hot but not too hot.

4. To insure the proper temperature, weight and consistency, etc., before beginning to make the poultice see that everything necessary is at hand so that there will be no unnecessary delay in applying it. The utensil used for mixing should be hot; the water should be boiling; the flaxseed is added to the boiling water gradually, at the same time stirring constantly with a spatula. The water must not stop boiling. When the mixture will drop clean from the spatula, it is of the right consistency. Beat the mixture thoroughly so as to introduce air and make it as light as possible. It is then spread evenly on old muslin and covered with gauze or muslin, in each case leaving sufficient margin to turn in neatly so that there can be no possible escape of the flaxseed. It is then wrapped in a warm towel or in a piece of warm flannel or old soft blanket and taken to the bedside. This flannel may be left on the part after the poultice is removed, to prevent chilling.

Unnecessary weight is particularly to be avoided when a poultice is to be applied to the chest when breathing is already an effort, as in pneumonia. The flaxseed should not be more than a quarter of an inch thick. Also, when applied to the abdomen for distention or to other tender areas, the poultice should be as light as possible. To other areas such as the extremities, where lack of weight is not such an important factor, the poultice may be half an inch thick or more.

5. The *care of the skin* and protection of the part is much the same as in the application of fomentations. Avoid burn-

POULTICE

ing the skin. Oil the skin if the applications are frequent, or if the skin is likely to be tender; apply the poultice gradually; keep raising part of it until the patient is accustomed to the heat. In applying a poultice to the posterior chest, unusual care must be taken to prevent burning as (when the patient is lying on his back) there is no opportunity for radiation of heat so that the intensity of the application or the heat is greatly increased. Precaution against burning must also be observed in distention when the skin is apt to be thin, shiny, stretched, and tender. Avoid exposure of the part before, during, or after the treatment. Cover the poultice with flannel or oiled muslin, so as to retain the heat. Fasten it in place with a binder or bandage as the part may demand. This should not be neglected. A patient who is restless, suffering from distention, mental and physical distress, and difficulty in breathing, as in pneumonia, or who is in severe pain, should not be obliged to remain in one position or to worry about keeping a poultice in place. He should not bear the weight of it "on his mind" as well as on his chest or abdomen. Fasten binders, etc., only tightly enough to retain the poultice in place, not enough to restrict breathing, etc.

When applying a poultice over an abdominal dressing to relieve distention in post-operative cases, a single layer of gauze may be placed between the poultice and the dressing to protect the latter. The dressing itself must never be interfered with. Even when a thick abdominal dressing covers the wound, the poultice should not be hotter than usual. The heat penetrates the dressing and, particularly when the tissues are relaxed, may so soften the tissues around the sutures that they give away. The same care must be taken when applied over all wounds, sore and suppurating areas. As the heat softens and expands the tissues, in some cases this application is contraindicated, as it gives the infection a chance to burrow deeper.

6. The *duration* of the application in all cases should be only as long as the heat is retained (never longer than one hour), otherwise it not only causes discomfort but may produce an effect opposite to that desired.

7. After the removal of the poultice dry the part. Carefully inspect the skin. It should have a pink healthy glow showing the desired effect has been obtained. Oil it if tender or very red, and cover with soft flannel to prevent chilling.

When a poultice is applied to relieve distention in pneumonia or post-operative cases, a rectal tube is usually inserted into the rectum (by order) to aid in the expulsion of gas.

PREGNANCY, DIET IN

MUSTARD POULTICE

Mustard is sometimes added to a flaxseed poultice to increase its irritating effect thus adding a *chemical* irritant to the *physical* irritant, heat.

The proportion of mustard to flaxseed should be ordered. For an adult it is usually one in eight, and for a child, about one in sixteen. To prepare, remove all lumps from the mustard flour. Then dissolve it in tepid water and add to the flaxseed mixture just before spreading on the muslin. First beat the mixture thoroughly to be sure the mustard is well mixed in it in order to avoid burning. Sometimes the flaxseed and mustard are mixed dry, then added to the hot water. As the mustard poultice is more irritating, the skin should be watched closely and the application removed when the skin is reddened. This usually occurs in from fifteen minutes to half an hour.

PREGNANCY, DIET IN

Adjusting the Diet.—The adjustment of the diet to cover the needs of the prospective mother and those of the developing child is essential. The amount of food taken by the mother is not materially changed during the first three months of gestation. An average normal diet is all that is necessary. After this time a twenty per cent. increase in the woman's diet will furnish adequate means both for her maintenance and for the growth and development of the child.

Type of Food.—The kind of food which is necessary for the pregnant woman to take during this period is very similar to that taken ordinarily. It is necessary to furnish food materials rich in calcium and phosphorus, with an adequate supply of proteins in their simplest form, in order to meet the requirements of the growing organism. Milk and eggs furnish the most efficient foods in this respect and the prospective mother should see that they form the chief items of her daily dietary. Milk furnishes calcium in its most available form for the developing skeleton of the growing infant, hence it is necessary to provide the mother with food to replace the mineral which is withdrawn from her body.

Meat in the Diet.—Meat should be eaten sparingly by the prospective mother, as it imposes needless work upon the already taxed kidneys and, if eaten in excess, will give rise to dangerous complications. Milk and eggs will provide ample protein for all purposes.

Albumen in the Urine.—Albuminuria is one of the most frequent complications in pregnant women. It should be combated and controlled as soon as possible. The allowance of meat should be cut down or entirely eliminated from

PREGNANCY, SIGNS AND SYMPTOMS OF

the diet until the urine clears up. When albuminuria is persistent in spite of efforts to overcome it, the patient must be placed upon a strict milk diet as used in acute nephritis, to prevent dangerous complications arising.

PREGNANCY, SIGNS AND SYMPTOMS OF

Table of the Principal Signs and Symptoms of Pregnancy in the Order of their Occurrence

	Months.								
	1	2	3	4	5	6	7	8	9
Suppression of menstruation.	×	×	×	×	×	×	×	×	×
Irritability of bladder.....	×	×	?	×	×	×	×	×	×
Morning sickness.....	?	×	×	×	?	?	?	?	?
Enlargement of breasts.....		×	×	×	×	×	×	×	×
Changes in size, shape, and consistency of uterus.....	?×	×	×	×	×	×	×	×	×
Vaginal pulsation.....		×	×	×	×	×	×	×	×
Mammary areola.....			×	×	×	×	×	×	×
Softening of cervix.....			×	×	×	×	×	×	×
Intermittent contractions....			×	×	×	×	×	×	×
Apparent shortening of cervix			×	×	×	×	×	×	×
Discoloration of vagina.....			?	×	×	×	×	×	×
Progressive enlargement of abdomen.....				×	×	×	×	×	×
Uterine souffle.....				×	×	×	×	×	×
Ballotement				×	×	×	×		
Perception of active movements.				?	×	×	×	×	×
Fetal heart.									

The **positive** signs are printed in **thick type**.

And see **BALLOTTEMENT**.

PREMATURE INFANTS, MANAGEMENT OF

See **INFANT, CARE OF**.

PREMATURE LABOR

See **ABORTION**.

PRESBYOPIA

See **ACCOMMODATION**.

PRESCRIPTION READING

It is important for the nurse to be able to read prescriptions, as she is occasionally ordered to administer a medicine, the ingredients of which are written in the form of a prescription.

Every prescription consists of four parts:

PRESCRIPTION READING

1. **The superscription** consists of the date, and the name of the patient; which are written at the top (occasionally the name of the patient is written at the lower right hand corner), and the symbol **R** which stands for the Latin word **RECIPE**, meaning "take thou."

2. **The inscription** consists of the names and the amounts of the ingredients used.

The names are written in Latin, usually in the genitive case, for example, *Camphora* (genitive, *Camphoræ*).

The most important ingredient in the prescription is written first, and is often called the **basis**.

The next most important ingredient is called the **adjuvant**, and is written next.

The next substance on the prescription is usually the one which disguises the taste of the mixture, such as a syrup, and is often called the **corrigent** or **corrective**.

The last substance on the prescription is the one in which all the others are dissolved, and it is often called the **vehicle**, **excipient** or **menstruum**.

The quantities of the ingredients are written in the metric or apothecaries' system of measurement.

In the metric system, the units used are the gramme and milligramme.

In the apothecaries' system, the units used are the dram, grain, minim, etc.

3. **The subscription** consists of the directions to the drug-gist for compounding the prescription. These are usually written in Latin.

Certain abbreviations are commonly used in the subscription. The most common ones are the following:

ss = semis (half)
q. s. = quantum sufficiat (as much as may be necessary)
q. s. ad = quantum sufficiat ad (as much as may be necessary to)

M. = misce (mix)

F.	= fiat or fiant	= make
Div.	= divide	= divide
caps.	= capsulas	= capsules
pil.	= pilulas	= pills
chart.	= chartas	= powders
tab.	= tabellas	= tablets

tab. trit.	= tabellas trituras	= tablet triturates
troch.	= trochiscos	= lozenges
supposit.	= suppositoria	= suppositories
	tales	= such

dos.	= doses	= doses
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PREScription READING

ad scat	= ad scatulam	= in the box
	pone in scat.	= put in a box
	cochleare	= spoon
	cochleare parvum	= teaspoon

The following are the most common Latin verbs used in prescriptions.

adde	= add
bulli	= boil
cola	= strain
filtra	= filter
solve	= dissolve
tere	= rub
tere bene	= rub well

The following are the most common adjectives used

æqualis	= equal
aa. = partes æquales	= equal parts
bulliens	= boiling
fervens	= hot
saturatus	= saturated
magnus	= large
parvus	= small

4. The **signature** is usually written at the end of the prescription and consists of the directions to the patient. It always begins with the abbreviation S. meaning signa = mark (on the label).

The quantities to be administered are written in the metric or apothecaries' system, for example, a teaspoonful is written 4.0 or $\mathfrak{z}\text{i}$. A dessertspoonful is written 8.0 or $\mathfrak{z}\text{ii}$.

The following are the abbreviations used in the signature. It is important for the nurse to know their definitions, as they may be used in her orders.

gtt.	= guttæ	= drops
A. M.		= morning
P. M.		= evening
o. d.	= omne die	= daily
o. m.	= omne mane	= every day
o. n.	= omne nocte	= every night
m. et. n.	= mane et nocte	= day and night
t. i. d.	= ter in die	= 3 times a day
b. i. d.	= bis in die	= twice a day
q. i. d.	= quatuor in die	= four times a day
		(not to be given at night)
q. h.	= quaque hora	= every hour
q. 2 h.		= every 2 hours
q. 3 h.		= every 3 hours

PRESENTATION AND POSITION

When medicines are ordered to be given q. 2 h. or q. 3 h. etc. they must always be given at night also.

stat. = statim = at once, immediately

s. o. s. = si opus sit = if necessary

This refers to only one dose. More than one dose should not be given if a medicine is ordered s. o. s.

p. r. n. = pro re nata = when required
(as often as necessary)

When a drug is ordered p. r. n. the nurse may use her judgment in giving more than one dose.

a. c. = ante cibum = before meals

p. c. = post cibum = after meals

At the end of the prescription, the physician's name is signed.

PRESENTATION AND POSITION OF FETUS

There are several terms, used to express the position of the fetus in the uterus, that must be defined and explained.

Attitude.—This is the relation of the various parts of the fetus to each other. The fetus *in utero* adopts an attitude characterized by universal flexion. The back is arched, the head bent down towards the chest, and the limbs folded in front with all their joints flexed. In this way the child comes to occupy the least possible space.

Lie.—By this is meant the relation of the long axis of the fetus to the long axis of the uterus. The most common is a *longitudinal* lie where the two axes are parallel. Sometimes the lie is *transverse*, and rarely it may be temporarily *oblique*.

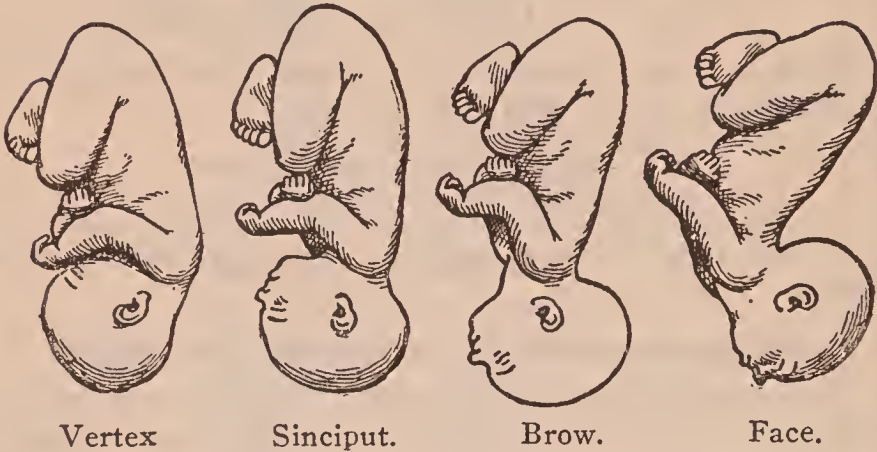
Presentation.—This means the part of the fetus that occupies the lower pole of the uterine cavity. The *presenting part* is the actual part first and most prominently felt through the cervix on vaginal examination. The two terms are very commonly confused, and employed promiscuously. It will be evident now that, given a longitudinal lie, the presentation may be either the head (cephalic presentation) or the breech (pelvic presentation). These are again subdivided because, owing to differences in the fetal attitude, the actual presenting part of the head or breech may vary. Thus a cephalic presentation may be either the vertex, sinciput, brow, or face, according to the state of flexion or extension of the neck. A pelvic presentation may be a full breech, a frank breech, a footling, or a knee, according to the state of flexion of the lower limbs.

In a transverse lie the presentation is usually the shoulder.

PRESENTATION AND POSITION

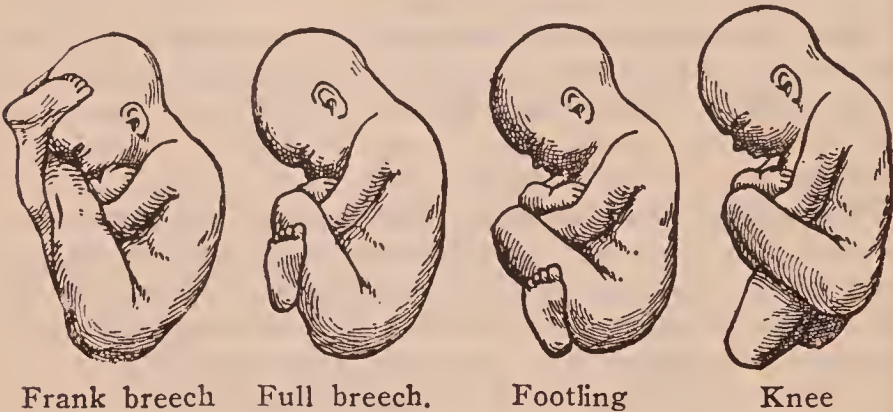
Frequency of Head Presentations.—In 96 per cent. of all cases the presentation is a cephalic or head presentation. This figure is made up as follows:

Vertex	95.5 per cent.	
Face	0.4	"
Brow	0.1	"
	<hr/>	
	96	"



Vertex Sinciput. Brow. Face.
Varieties of Head Presentation.
(From Johnstone's Textbook of Midwifery)

Of the remaining 4 per cent., breech presentations form 3.5 per cent., and shoulder presentations 0.5 per cent.



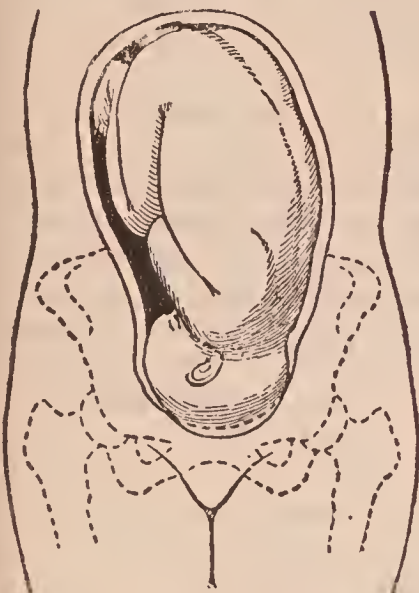
Frank breech Full breech. Footling Knee
Varieties of Pelvic Presentation.
(From Johnstone's Textbook of Midwifery)

Position.—The position of the fetus is its relation to the pelvis of the mother. It is described in terms of a certain fixed point on the presenting part called the *denominator*. For each presentation there are four possible positions according as the denominator is in one or other quadrant of the pelvis—left anterior, right anterior, right posterior, and left posterior.

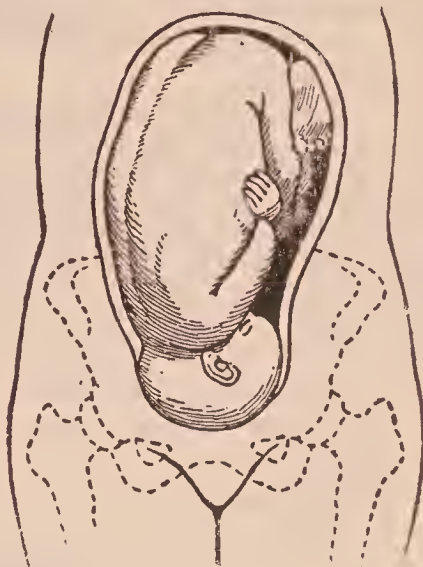
PRESENTATION AND POSITION

In the more frequent presentations the points chosen as the denominators are:

<i>Presentation.</i>	<i>Denominator.</i>
Vertex	Occiput.
Face	Mentum (chin).
Breech	Sacrum.
Shoulder	Acromion.



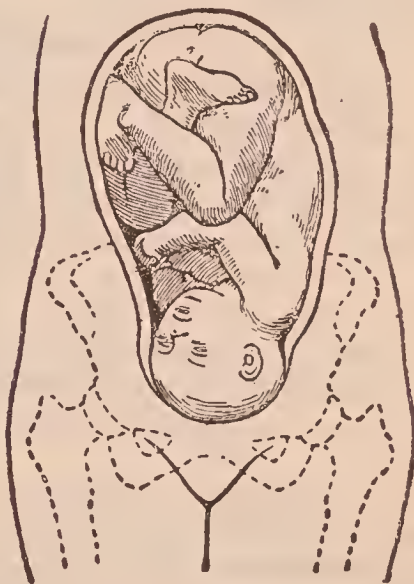
Vertex L. O. A.



Vertex R. O. A.



Vertex R. O. P.



Vertex L. O. P.

(From Johnstone's Textbook of Midwifery)

Vertex Presentation.—The four possible positions of a vertex presentation are as follows:

I. Left occipito-anterior, or L.O.A. The head lies with its sagittal suture approximately in the right oblique diameter

PRESSURE

of the brim of the pelvis, the occiput opposite the left foramen ovale, the sinciput opposite the right sacro-iliac joint.

II. Right occipito-anterior, or R.O.A. The sagittal suture is approximately in the left oblique, the occiput opposite the right foramen ovale, and the sinciput opposite the left sacro-iliac joint.

III. Right occipito-posterior, or R.O.P. The sagittal suture lies approximately in the right oblique, the occiput at the right sacro-iliac joint, and the sinciput opposite the left foramen ovale.

IV. Left occipito-posterior, or L.O.P. The sagittal suture lies approximately in the left oblique, the occiput at the left sacro-iliac joint, the sinciput opposite the right foramen ovale.

The positions are always taken in order from the left anterior quadrant round the pelvis because the left anterior is the quadrant in which it is most usual to find the occiput. The *order of frequency* of the four positions is as follows:

I. L.O.A.	70	per cent	. . .	1st	in frequency.
III. R.O.P.	20	"	. . .	2nd	"
II. R.O.A.	8	"	. . .	3rd	"
IV. L.O.P.	2	"	. . .	4th	"

PRESSURE

See HEMORRHAGE.

PROCTOCLYSIS

Proctoclysis is rectal irrigation.

Articles required:

1. Irrigator stand and can.
2. Rubber sheet 20 × 30 inches.
3. Bath towel, dressing towel.
4. Hot water bag.
5. Tray, provided with:
 - (a) Special proctoclysis tube and accessories.
 - (b) Glass graduate containing fluid, salt solution one-half physiological strength, at temperature of 100° to 105° F.
 - (c) Bath thermometer.
 - (d) Vaseline, applicator.

Procedure.--Place rubber sheet covered with bath towel under buttocks, adjust tubing, pour liquid into irrigating can, and allow to run through until the tube is warm, lubricate tip with vaseline and insert carefully. Regulate flow, which is usually 3 drops per second. If necessary to hold nozzle in place, apply a strip of adhesive plaster over tube close to nozzle and fasten to patient's thigh. See that temperature of fluid is maintained throughout treatment. Watch

PROSTATE

patient carefully to see that absorption is taking place and fluid is not expelled.

If regular proctoclysis outfit is not used, a proctoclysis tube or a catheter No. 12 E may be substituted. To maintain temperature, a hot water bag or can placed on bed at side of patient and a part of the tubing brought in contact with it will keep fluid warm. Renew in irrigating can as fluid becomes cool.

PROPESIN

See ANESTHESIN.

PROSTATE

One of the most common operations done upon the male genital tract is that of prostatectomy, removal of the prostate gland. This is performed for simple hypertrophy, or for cancer. It is known that the prostate consists mainly of three lobes, the middle coming into close relationship with the urethra and the lateral lobes coming into relationship with the rectum. When the prostate increases in size, it follows the path of least resistance and projects into the bladder, and the increase in the size of the median lobe interferes with the free passage of urine because it obstructs the internal opening of the urethra. This results in frequency of urination, then urinary retention which must be relieved by a catheter, and from frequent catheterizations a condition of cystitis is very often established. The suffering is quite severe, and the only measure affording permanent relief is the removal of the obstruction (prostatectomy).

Prostatectomy

This operation is often preceded by a period of improving the patient's nutrition, and his urinary output by regular catheterizations. The operation resolves itself into a choice of perineal or suprapubic prostatectomy.

Perineal Prostatectomy.—The perineum is shaved and eight hours before operation the usual soap-suds enema is given. The patient is placed in a lithotomy position with the pelvis raised by sand bags and the prostate is enucleated through the perineum.

Post-operative Treatment.—The retained catheter is connected to bottle drainage and the urine collected. The gauze tampon which usually occupies the space of the removed prostate is taken out on the fifth day; the catheter is removed on the seventh, and from then on the urethra is treated with sounds of various sizes.

Suprapubic Prostatectomy.—In this procedure the prostate is removed through the bladder. It is done in two stages. The first operation is a suprapubic cystotomy, the second the

PROTARGOL

actual removal of the gland through the previous bladder wound.

First Stage:—As a rule, catharsis is given forty-eight hours previous to the day of operation. Before operation the bladder is irrigated and often some novocaine or alypin is injected. The bladder is kept distended and the cystotomy is done under local anesthesia. A button drainage tube is placed in the opening of the bladder and the tube clamped. When the patient arrives in his room the clamp should be removed from the tube and the bladder drained continuously, or intermittently. The diet should be very light and soft, fluids allowed in liberal amounts.

Second Stage:—While some surgeons proceed to enucleate the prostate immediately after cystotomy, the majority wait five or more days before completing the operation. Naturally there will be rather a profuse hemorrhage following the blunt dissection of the gland. This may be controlled by tampons, but a better result is obtained if a bag hemostat is used. This is made of rubber, is inflatable and when distended and placed within the bladder exerts pressure on the bleeding areas. One connection of the bag passes through the urethra, and is the means by which air is introduced. This is removed in twenty-four to forty-eight hours.

The suprapubic wound is freely drained, and at the end of forty-eight hours a button tube is inserted, connected to the bottle drainage and the patient allowed out of bed. At the end of a week the patient is encouraged to void, and as soon as he does so in sufficient amounts, the suprapubic tube is removed. Of course, the urine will leak in small amounts, but the sinus is healed in from the thirteenth to the twentieth day.

Cancer of Prostate

In the early stages this is treated by prostatectomy. In the late periods, radium is tried as a palliative procedure.

PROTARGOL

Protargol is a compound of albumin and silver containing 8.3 per cent. of silver. It is used as an antiseptic, and as an astringent on mucous membranes in 1 to 10 per cent. solutions; as irrigations in 1 to 1000 to 1 to 2000 and in the form of bougies and tampons in 5 to 10 per cent. solutions.

PRUNUS VIRGINIANA (WILD CHERRY)

Prunus Virginiana is obtained from the bark of the wild cherry tree. Its active principles are amygdalin, a glucoside, and a ferment, **emulsin**.

Prunus Virginiana is often given to increase expectoration and lessen coughing, together with other cough medicines.

PSYCHONEUROSES

Syrup of Prunus Virginiana (15 per cent. strength); dose 1 to 4 drams.

PRUSSIC ACID

See HYDROCYANIC ACID.

PSYCHASTHENIA

See PSYCHONEUROSES.

PSYCHONEUROSES

The **psychoneuroses** include neurasthenia, psychasthenia and hysteria.

Neurasthenia

Neurasthenia is a nervous disorder, or neurosis, characterized by mental and physical fatigability, irritability of mood and various hypochondriacal ideas. It is commonly called "nervous prostration."

Physical symptoms.—These are loss of appetite, loss of weight, although sometimes these patients are well nourished, headache, with feeling of weight or pressure or of a tight band about the head, insomnia and feeling of exhaustion on awaking, muscular weakness and fatigue on slight exertion, constipation, gastric and cardiac distress, pain in the back of the neck and at the end of the spine and many other discomforts.

Mental symptoms.—These patients are over-sensitive to external impressions especially of sound—the wind, the trees, the crickets and natural sounds which are beyond control, or of sounds which originate from people, humming, whispering, talking, creaking of shoes, closing of doors, etc. They are self-centered, irritable, anxious, depressed, restless, unable to apply themselves to any mental work and have many hypochondriacal ideas.

Psychasthenia

Psychasthenia is a more serious disorder of the nervous system, and is characterized by obsessions, phobias, doubts and feelings of anxiety and insufficiency. It is sometimes called a "border line" disorder, for it lies between a neurosis and psychosis and has characteristics of both.

The **physical symptoms** are much the same as in neurasthenia. The **mental symptoms** are obsessions—ideas which besiege and possess the mind against the desire and will, phobias or morbid fears of crossing open spaces and bridges, of high places, of closed rooms, of being alone, of the dark, or dirt, etc., doubts about insignificant matters like closing a door or posting a letter, inability to decide even the simplest matters, what to do next, which shoe to put on first,

PSYCHONEUROSES

etc., feelings of anxiety and insufficiency, of being unable to do what is expected of them and of being unequal to the duties of life.

Hysteria

Hysteria is a morbid state of the nervous system in which the mind produces symptoms simulating some forms of organic disease.

Physical symptoms.—These patients are as a rule well nourished, but there may be loss of appetite and loss of weight. Other symptoms may be nausea, vomiting, difficulty in swallowing, "globus hystericus," rapid or slow pulse, rise of temperature, dyspnea, hiccough, peculiar cries, whoops and noises which simulate the cries of animals, contractures and paralyses, aphonia, fainting spells, tremors, rhythmical spasms and convulsions. The convulsions may resemble epilepsy, but the patient as a rule does not fall heavily, nor where much injury can be done, and does not bite the tongue severely. There is a rare form in which the convulsive attacks are very severe and continue for several days.

Mental symptoms.—Disturbances of sensation are common and there may be hyperesthesia or anesthesia of a small area or of a whole part of the body; hearing is often rendered more acute, or it may be lost, and sight may also be lost; hallucinations may be present; amnesia for certain events and conditions is common; the emotions show great fluctuations and the mood may vary from elation to depression; the disorders of conduct may range from stupor to delirium, and many acts which are extremely dangerous and may result fatally are committed for the purpose of exciting alarm or sympathy.

Nursing procedures.—These are among the most trying and difficult patients to nurse, for the mental impairment is so slight, and the lack of self-control, the irritability, the incessant questioning, groundless worries, hesitation and indecision tax the patience and resourcefulness of the nurse to the utmost. The mind is so often alert, and they appear so sensible, that it is difficult at times not to feel that they could be different if they would; and this is where much of the difficulty lies, the lack of power to will. But it must be remembered that in their minds they truly suffer and need careful and intelligent nursing.

When the general condition needs rest and building up, the physician prescribes "**Rest cure**," a form of treatment first employed by Dr. S. Weir Mitchell. This consists of separation from the family or friends, either at home or in hospital, preferably in hospital, for it has been proved that the absolute obedience which is imposed by the physician

PSYCHONEUROSES

is more readily gained when the patient is removed from his accustomed surroundings, which are associated with his illness, and from the family and friends who too often express undue sympathy for the symptoms and unintentionally criticize and interfere with the treatment; absolute rest of body and mind, for the patient is put to bed and is not allowed to have so much as a newspaper or a letter; regular diet at fixed hours with sometimes a diet of milk exclusively for a number of days followed by a sudden, unexpected change to full diet; passive exercise by massage; some form of hydrotherapy, a cold pack or warm bath at bedtime to combat the insomnia; and, in so far as possible, the exclusive service of a special nurse. The duration of this treatment ranges from four to ten weeks depending on the response of the patient. When repose of body and mind is complete, a return to normal activities is gradually made by first sitting up in bed with a back rest, then in a chair for definite periods. At this time the patient is permitted to read a little, to receive a letter, etc. During this period the nurse must be alert to detect the recurrence of old ideas and note carefully the reaction to them.

In the treatment of these disorders very little is left to the decision of the patient in the beginning, for a routine or program which provides for every hour in the day is prescribed by the physician. These orders must be punctually and fully carried out. Many times there is a desire on the part of the patient to compromise some part of it, to revert to the old ways of doing only what was agreeable and convenient, and here the nurse must show no hesitation, no indecision, but demand that the full requirement of the order be met. The nurse who has won the confidence and respect of her patient, and has learned to make simple, direct and positive statements, will not have much difficulty in carrying out the physician's directions.

All **unnecessary nursing procedures** should be avoided, for many patients have been made worse by the solicitous ministrations of their family, who in their eagerness have tried to appease and satisfy every whim and notion. Listen patiently to all the patient will tell, for to unburden the mind affords great relief, and be sympathetic with the patient but not with the symptoms. Do not ask how he slept or how he feels, but assume that he slept well, that he feels better day by day, that improvement is being made and that recovery is sure to come. A nurse who is genuinely interested and sympathetic, punctual in carrying out the orders prescribed, who is cheerful, patient, yet decisive and firm, hopeful and eager for recovery, can do much towards arousing the patient from his unhappy and miserable state

PUBERTY

and help him to attain one of hopefulness, interest and usefulness in the future.

As progress is made some forms of **occupation** are given, the planting of seeds, growing of bulbs and plants, sprouting wheat seeds in a sponge, copying, memorizing, the study of birds, bees, trees and flowers, all the various forms of handiwork, simple household tasks, and light gardening, gradually increasing the demand for both physical and mental energy until a normal condition has been attained.

PUBERTY

See MENSTRUATION.

PUBIC LOUSE

See LICE.

PUERPERAL HEMORRHAGE

See POST PARTUM HEMORRHAGE.

PUERPERAL INFECTION

Under this heading are included all the morbid conditions arising in the puerperium as a result of the introduction of organisms into the genital tract before, during, or after labor at full term, miscarriage, or abortion.

Etiology.—The following organisms have been found:

Streptococcus Pyogenes.—This is the cause of the most grave and epidemic forms of the infection. Frequently in the most virulent cases it is found in company with other organisms, especially the *B. Coli communis*.

Staphylococci Pyogenes Aureus et Albus.—These common pus-forming organisms are found everywhere—on the skin, in dust, and especially in sores or eruptions. Hence the peculiar risk of any sores on the person of either the nurse or obstetrician.

Bacillus Coli Communis.—This organism is always present on the vulva owing to the proximity of the anus. Hence the importance of cleansing the genitals of the patient before labor, and during the puerperium.

Gonococcus.—That this organism may cause puerperal infection there is no doubt, although the infection is rarely acute.

The following pathogenic organisms have also been found:

Bacillus Diphtheriæ (Klebs Loeffler); *Diplococcus Pneumoniæ*; and *Bacillus Tetani*.

The all-important facts are that pyogenic organisms are never, under normal circumstances, present in either the vagina or uterus, and that, if they are found in these situations, they have been introduced from without. The only exception to this statement is the gonococcus, which is able to live in the vagina in spite of the acid-forming bacilli, and

PUERPERAL INFECTION

sometimes lies latent there or in the cervix, and becomes activated again during the puerperium.

Sources of Infection.—These have already been discussed under the management of labor. It must be remembered that even a perfectly cleansed hand or a sterile instrument may be a source of danger by conveying organisms from the vulva. Therefore the cleansing of the vulva is equally as important as the cleansing of the hands and instruments.

Specially strict precautions ought always to be taken if the physician or nurse has been recently in contact with a case of puerperal or surgical sepsis, because infection from such a source seems to be particularly virulent and dangerous.

Clinical Aspects of Puerperal Infection

Sapremia.—*Local Symptoms.*—If the infection has occurred during labor the symptoms may show themselves on the second or third day; but if the infection occurs later, the symptoms appear correspondingly later. The principal local sign is that the lochial discharge becomes increased in amount, dirty brownish in color, and very fetid in odor. The stain on the diaper, which is usually dark in the center and pale at the edges, tends in such cases to be dark at the edges and pale in the center. The involution of the uterus ceases, and that organ remains unduly large, soft, and tender.

General Symptoms.—These are ushered in by a rise of temperature—rarely higher than 102° —accompanied by some feeling of chilliness, but rarely by a definite rigor. The pulse rate rises in correspondence with the temperature. There is generally some headache and general malaise. If untreated, the general condition may become serious, and a septicemic infection may ensue, indicated by rigors, persistently frequent pulse, and high temperatures.

Septicemic Infection.—In the cases falling under this heading the infecting organisms are pathogenic or pyogenic in nature, the streptococcus, staphylococci, and *Bacillus Coli communis* being the commonest. They live and flourish in living tissues, and are thus capable of passing into and multiplying in the blood. The pathological changes are those of *septic endometritis*, and the symptoms vary in intensity according to whether the organisms are stopped by the protective layer of leucocytes in the uterine wall, or succeed in penetrating into the lymphatics, and so into the general systemic circulation. In the former case the patient usually slowly recovers; in the latter we are dealing with a general septicemia, and the outlook is much more grave.

In *septic endometritis* the symptoms usually come on not later than the third day. Speaking generally they closely

PUERPERAL INFECTION

resemble those of sapremia, but are more severe. The first symptom is usually a sharp rise of temperature, to which attention is drawn in many cases by a rigor. The temperature may rise to 103° or 104° , and fall rapidly with the profuse perspiration that generally follows. Thereafter the temperature tends to remain high with small and variable daily remittences. The pulse-rate is markedly increased, and an important point is that it does not necessarily correspond to the temperature, remaining high even when the temperature has fallen. In this respect the pulse is a better guide to the patient's condition than the temperature.

Locally the uterus is probably rather unduly large, but the process of involution is not so characteristically interfered with as in sapremic conditions. It is usually tender on palpation. The lochia are generally, but by no means invariably, diminished in quantity, and in severe cases may be altogether suppressed. They are fairly normal in appearance, and are not characteristically fetid as in sapremia. If the infection is mixed, there may be fetor, but in serious cases of streptococcal infection there is an entire absence of it. The mammary secretion is frequently suppressed.

General Septicemia.—If the infective process passes beyond the endometrium, the symptoms become more severe. Each fresh extension of infection is marked by a rigor, and a further rise of the temperature and pulse. Involvement of the peritoneum usually causes abdominal pain. The patient looks very ill, the eyes sunken, the nose pinched, and the skin slightly jaundiced or muddy. The mind is usually clear, even up to a very short time before death, but occasionally delirium or coma supervenes. The tongue, which is clean and moist in mild cases, becomes furred and ultimately dry, glazy, and cracked. Vomiting may occur, especially when general peritonitis has developed, and "black" vomiting is of grave prognostic significance. Diarrhea with offensive motions is a late symptom and also of serious import. It may, however, be induced by the injudicious use of mercurial salts in the douches. Rashes are not uncommon in grave cases; sometimes merely transient miliaria due to the perspiration, but often scarlatinaform, or in the form of erysipelatous patches.

If *general peritonitis* develops, there is usually pain over the whole abdomen, but most marked over the uterus, with resistance and tenderness on palpation. The abdomen also becomes distended from paresis of the bowels. The patient lies on her back with the knees drawn up. Vomiting is common, and in the later stages diarrhea.

Cases in which acute general septicemia or acute general peritonitis have developed usually end fatally within a week.

PUERPERAL INFECTION

Pyemia is very liable to occur in the course of more protracted cases. It may occur as an additional complication in a case that has been more or less acute from the outset, but sometimes it arises abruptly about the end of the first week in cases in which only a slight degree of pyrexia has been observed. Its main features are exactly the same as those of pyemia arising from other sources, the principal characteristic being a succession of rigors with high temperature and pulse-rate, with definite remittences of pulse and temperature between the rigors. The rigors indicate fresh detachments of infected thrombi. Metastatic abscesses form where the thrombi lodge, either in the superficial tissues or in the viscera. Septic endocarditis, pneumonia, empyema, and pericarditis are amongst its possible results. The seriousness of the case varies with the virulence of the infection and the situation of the metastatic abscesses.

Prognosis

The prognosis of pure sapremia is good, but unless a bacteriological examination has shown the case to be one of uncomplicated sapremia, the prognosis should be guarded, because a case that begins as sapremia may pass on into a septic infection.

In septic cases the prognosis is much more serious. Even if the infection is not very virulent such cases are apt to be protracted, and open to relapse at any time, while late complications such as parametritis, phlegmasia alba dolens, or pyemia may supervene. In acute general septicemia or general peritonitis the outlook is almost hopeless.

Treatment

Prophylaxis.—The main points to which attention should be paid, are:

(1) The patient should be brought into as good a condition of health as possible before labor so as to be able to resist any morbid process. This involves careful attention to the hygiene of pregnancy.

(2) Both obstetrician and nurse must endeavor to avoid contact with any infectious patient, particularly one with puerperal septicemia, or any septic wounds. Where this is unavoidable, they must exercise the most conscientious care in disinfecting themselves, changing and disinfecting clothes, etc.

(3) Above all, strict attention to antiseptic and aseptic precautions must be observed in every contact with the patient immediately before, during, and after labor.

(4) Vaginal examinations should be as few as possible.

(5) Each stage of labor must be properly managed so as

PUERPERIUM

to avoid exhaustion, unnecessary lacerations, and hemorrhage.

(6) All lacerations should be repaired at once so as to close up possible channels of entrance of infection.

(7) After the birth of the child neither finger nor instrument should be allowed to enter the vagina, unless absolute necessity demands it.

PUERPERIUM, MANAGEMENT OF

General Management.—As soon as labor is over and the patient has been made comfortable as described under the management of the third stage of labor, the first essential to secure for her is *Rest*. To this end she should be left to sleep, the baby being removed to another room, and the blind being drawn. The room should not be made so dark that any undue pallor of the face will not be observed.

Visitors, except the patient's husband or mother, should be rigorously excluded for two or three days, and after that the nurse must exercise her discretion as to the admission of other friends, the safe rule being that the fewer there are the better. Sleep is of the first importance, and the mother should be encouraged to sleep for two hours every afternoon during the lying-in period.

The *vulvar pads* for the absorption of the lochia must be changed at frequent intervals, depending on the amount of discharge, but not less than every four hours for the first few days. Each time a fresh pad is applied the vulva should be gently cleansed.

Strict *asepsis* must be the inviolable rule in the management of the puerperium. The nurse must carefully wash her hands and soak them in an antiseptic before she handles the patient's genitals. In cleansing the vulva, pledgets of sterile or antiseptic wool soaked in biniodide or weak lysol must be used, one pledget for each wipe, and all wiping being done from before backwards. The same care must be observed when the patient uses the bed-pan. In a normal case it is unnecessary and undesirable to employ antiseptic vaginal douching.

The temperature is taken in the mouth at 8 A.M. and 5 P.M. In practice any temperature over 99, and any pulse over 90, requires to be investigated and the reason found. In all cases attended by a trained nurse a chart of the pulse and temperature, etc., should be strictly kept.

Bladder.—There may be difficulty in passing urine. The usual adjuvants, such as hot water in the bed-pan, hot (antiseptic) fomentations to the perineum, etc., should be tried. Failing these the patient may be gently turned round

PULMONARY EMBOLISM

on her hands and knees. If this fails, and *if the bladder is distended* so as to form a palpable tumor above the symphysis, the catheter must be passed. This requires the most scrupulous asepsis in its performance. The patient must be placed on her side, the vulva exposed with clean hands, and the vestibule wiped free of lochia with an antiseptic swab. The catheter must be boiled before use, and *passed by sight*.

Bowels.—It is advisable to give a brisk laxative on the evening of the second day. Half an ounce or more of castor oil is probably the best, but may be replaced by licorice powder, or an aloin and nux vomica pill. If the patient is not going to nurse, the laxative should be given on the second morning, and should take the form of a brisk saline purge—magnesium sulphate, for example.

Diet.—If the patient feels so inclined she may have a cup of warm milk, weak tea, or gruel immediately after labor. For the first twenty-four hours the diet should be quite light and mainly fluid—milk, tea, coffee, cocoa, gruel, etc., with toast or bread and butter. Custards and soups may be added the following day, and after the bowels have been moved the ordinary diet may be gradually and rapidly resumed. It is a mistake to keep a healthy puerperal woman on a low diet. The best diet for a nursing mother contains much milk food, with no spiced foods or other indigestible articles.

After the first day the patient should be propped up with two pillows to nurse her child, and after lactation is established she may take her meals in the same posture. After the fifth day she may be allowed to sit up, but it is best to keep her in bed until at least ten days have elapsed. If the patient can stay in bed for a fortnight, so much the better. After that she should be allowed up on a couch, one hour the first day, two hours the second day, and so on. By the end of the third week she may be allowed out for a drive, and in the following week for short walks.

PULMONARY EMBOLISM (POST-OPERATIVE)

This is not very common, and may occur after the simplest operations; for example, after an appendicectomy, or an operation for varicose veins; it may be preceded by a thrombosis of the veins of the lower extremity, or come as a distinct entity. As a rule, it is ushered in by a sudden pain in the chest, dyspnea, bloody expectoration, rapid pulse, and slight rise in temperature. If the chest is auscultated the doctor may sometimes note a friction sound, or signs of beginning pneumonia may be evident. Occasionally, instant

PULSE

death occurs, and at best the mortality is high, varying from seventy to eighty per cent.

Treatment.—Patients who develop a phlebitis or thrombosis of the veins of the lower extremity, or any other region, should be kept in bed until this condition absolutely subsides, because a small piece of blood clot may break off, and lodge in the lung as an embolus. Patients should not be permitted to be too active after operation even if their condition is excellent. The treatment of embolism is to reassure the patients, for they are apt to become greatly alarmed at the sight of their bloody expectoration. To further quiet them morphine is administered. If the diagnosis of its location is made, it is customary to strap that side of the chest in which the embolus is lodged. This will immobilize the affected lung as much as possible.

The family of a patient suffering from a pulmonary embolism should be apprised of the impending danger, for even though the patient may recover from the shock of the embolism itself, it may give rise to an embolic pneumonia and a recovery from this condition is exceptionally rare although it occasionally occurs.

PULSE

When the finger is placed on an artery, a sense of resistance is felt, and this resistance seems to be increased at intervals, corresponding to the heart-beat, the wall of the artery at each heart-beat being felt to rise up or dilate under the finger. This alternate dilatation and contraction of the artery constitutes the pulse; and in certain arteries which lie near the surface this pulse may be seen with the eye. When the finger is placed on a vein, very little resistance is felt; and, under ordinary circumstances, no pulse can be perceived by the touch or by the eye.

As each expansion of an artery is produced by a contraction of the heart, the pulse, as felt in any superficial artery, is a convenient guide for ascertaining the character of the heart's action.

Locations where the pulse may be felt.—The pulse may be counted wherever an artery approaches the surface of the body. These locations are:

(1) The *facial* artery, where it passes over the lower jawbone.

(2) The *temporal* artery, above and to the outer side of the outer canthus of the eye.

(3) The *brachial* artery, along the inner side of the biceps muscle.

(4) The *radial* artery, on the thumb side of the wrist. On

PURGATIVES

account of its accessible situation the radial artery is usually employed for this purpose.

(5) The *femoral* artery, where it passes over the pelvic bone.

(6) The *dorsalis pedis*, on the dorsum of the foot.

Points to note in feeling a pulse.—In feeling a pulse the following points should be noted:

(1) *Frequency*, or the number of pulse-beats per minute.

(2) *Strength*, or the force of the heart-beat.

(3) *Regularity*, or the same number of beats per minute.

(4) *Equality*.—Each beat should have the same force, not some strong and some weak. It sometimes happens that a beat is missed because the heart-beat is too weak to distend the artery. This called an *intermittent* pulse.

Occasionally there is a lack of tone in the arterial walls and a *dicrotic* pulse is felt. This means that the pulsations are divided and the second part of the beat is weaker than the first.

(5) *Blood pressure*.—This is suggested by the amount of force that is required to obliterate the pulse.

Average frequency of the pulse.—The average frequency of the pulse in man is seventy-two beats per minute. This rate may be increased after eating or by muscular action. Even the variation of the muscular effort entailed between the standing, sitting, and recumbent positions will make a difference in the frequency of the pulse of from eight to ten beats per minute. Mental excitement may also produce a temporary acceleration, varying in degree with the peculiarities of the individual. Age has a marked influence. At birth the pulse rate is about 130 per minute; at three years, 100; in adult life, 72; in old age, 65. It is somewhat more rapid in women than in men and is lowered during sleep. Idiosyncrasies are frequently met with. A person in perfect health may have a much higher or a much lower rate than 72. The relative frequency of the pulse and respirations is about four heart-beats to one respiration.

As a rule, the rapidity of the heart's action is in inverse ratio to its force. An infrequent pulse, within physiological limits, is usually a strong one, and a frequent pulse comparatively feeble; the pulse in fever or debilitating affections becoming weaker as it grows more rapid.

PUMPKIN SEED

See PEPO.

PURGATIVES

See CATHARTICS.

PYELITIS

PYELITIS

See KIDNEYS, SURGICAL CONDITIONS OF.

PYEMIA

See SEPSIS.

PYLOROSPASM

See STOMACH.

PYONEPHROSIS

See KIDNEYS, SURGICAL CONDITIONS OF.

PYOSALPINX

See FALLOPIAN TUBES, DISEASES OF.

PYRAMIDON

Pyramidon is an artificial chemical substance which acts like antipyrin. It relieves nervous pains and headaches. It reduces temperature slowly, but the temperature stays down longer. In large doses it weakens the heart action. Dose is 1 to 6 grains.

See ANTIPYRETICS.

PYROGALLOL

Pyrogallol or **pyrogallic acid** is a light crystalline substance made by heating gallic acid.

The action of pyrogallol is similar to that of carbolic acid.

Applied to the skin or mucous membranes it checks the growth of bacteria, acting as an antiseptic; it destroys parasites and produces redness of the skin. It usually stains the skin or clothing a dark brown color.

Pyrogallol is occasionally absorbed from the skin and produces poisonous symptoms which resemble those of carbolic acid poisoning. (See CARBOLIC ACID).

Pyrogallol (Pyrogallic Acid) is used in the form of 5 to 20 per cent. ointments.

Q

QUASSIA

A drug obtained from the wood of *Picræna excelsa*, a large tree which grows in Jamaica. It contains an active principle, quassin.

Preparations

Fluidextract of Quassia; dose 5 to 30 minims.

Tincture of Quassia; dose 15 to 60 minims.

A 10 per cent. infusion of quassia is given as an enema for round worms in children.

QUERCUS

Quercus is the bark of the white oak tree. It contracts the tissues and checks the secretions of the mucous membranes, because of quercitannic acid which it contains. It is used as an enema in prolapsus recti or hemorrhoids, and as a vaginal douche.

Preparation

Fluidextract of Quercus; dose 15 minims.

QUICKENING

By this is meant the first conscious feeling by the mother of the movements of the fetus in the uterus. Most commonly it occurs at the fourth and a half month, or just about mid-term. The first felt movements are very feeble, and have been likened to the "fluttering of a bird in the closed hand." By the primigravida they may be mistaken for flatulence or colic, but the multipara will be able to recognize them. If the movements are not felt by the hand of the examiner little weight can be attached to this as a sign of pregnancy.

QUICKSILVER

See MERCURY.

QUININE AND CINCHONA

Quinine is a white powder, an alkaloid, the active principle of *cinchona*, or Peruvian bark. This is the bark of the

QUININE

cinchona tree, which grows in the Andes or other mountainous districts on the western coast of South America. Besides **quinine**, the active alkaloid, cinchona contains the alkaloids, **quinidine**, **cinchonine**, and **cinchonidine**. They resemble quinine in their effects; which are weaker, however.

Appearance of the Patient

When quinine is given to a patient suffering from malaria, it prevents the chills, fever and sweats, which are characteristic of that disease.

After administration of a single average dose of quinine, the patient usually complains of a bitter taste in the mouth, he feels brighter, and the pulse is perhaps somewhat more rapid and stronger. If there has been fever, the temperature is lowered several degrees.

If the quinine is given for some time, the patient feels better, he has a better appetite, his bowels move more regularly, he feels brighter and stronger and is more active. The pulse is somewhat stronger and more rapid, the breathing is deeper and somewhat more rapid.

Local action: Applied to the skin or mucous membranes, quinine causes slight redness and acts as an antiseptic. It is not generally used as an antiseptic, because it is too expensive. It is said to increase the growth of hair and therefore forms an ingredient of many hair tonics.

Internal Action. In the mouth: Because of its very bitter taste quinine increases the appetite and the secretion of saliva.

In the stomach: It lessens the action of pepsin, thus retarding the digestion of protein food. In large doses, it occasionally causes nausea and vomiting.

In the intestines: It retards the action of the trypsin of the pancreatic juice, and increases the secretions and peristalsis, often causing frequent movements of the bowels.

Action after Absorption

Quinine is slowly absorbed into the blood, principally from the stomach. When it enters the blood, it acts as a specific for malaria, and it slightly affects the nutrition and the action of all the tissues and organs.

Effect of Quinine in Malaria.—If a patient suffering from malaria is given quinine, **the quinine enters the blood and destroys the plasmodia**. The chills, fever and sweats are then prevented, and the disease is cured. The use of quinine must be continued for some time, however, even after the symptoms have disappeared; until all the plasmodia in the blood are destroyed, and the patient is free from attacks.

QUININE

Effect on nutrition and metabolism: Quinine increases the nutrition of the tissues and organs of the body, by preventing the nitrogenous, or protein food from being used up. In this way quinine acts as a tonic, slightly improving the action of all the tissues and organs of the body and making the patient feel better and stronger.

Action on the blood: Besides its destructive action on malarial parasites, quinine prevents the red blood corpuscles from taking up oxygen as readily as before. It also lessens their number and checks the movements of the white blood corpuscles.

Action on the circulation: The pulse is made somewhat stronger and faster, because the contractions of the heart and blood vessels are increased. Large doses occasionally cause a slow and weak pulse because of the slightly weakened contractions of the heart.

Action on the nervous system: Quinine lessens nervousness and neuralgic pains.

Action on the senses of sight and hearing: Large doses of quinine very frequently cause ringing in the ears, and dimness of vision.

Action on the uterus: Quinine increases the contractions of the uterus during labor; it occasionally causes abortion.

Effect on temperature: The temperature is lowered because oxidation of the nitrogenous or protein substances of the tissues is lessened, and less heat is produced.

Excretion

Quinine is eliminated from the body by the urine, mostly in about 6 to 8 hours.

Idiosyncrasies

Many individuals are especially susceptible to quinine, even small doses causing poisonous effects. In some individuals, the following unusual symptoms occur, even from very small doses:

1. Eruptions on the skin, such as areas of redness resembling the scarlet fever rash, hives or urticaria, and occasionally small blisters.
2. Occasionally scanty urine, accompanied by pain; often the urine is tinged with blood or hemoglobin.
3. Slow and weak pulse, and a feeling of weakness.

Poisonous Effects

Since quinine is very frequently given in large doses for malaria, poisonous effects are not uncommon. These effects result from continued use of quinine, or from very large doses taken to produce abortion. While the symptoms which result may be alarming, they are rarely, if ever, fatal.

QUININE

Symptoms.—The first and most characteristic symptom of quinine poisoning is:

Ringings in the ears, or roaring sounds in the ears. Often the patient may become temporarily deaf. Rarely the deafness remains permanent.

2. **Dimness of vision**, especially for colors.

3. Temporary blindness or "color blindness" The blindness is occasionally permanent.

4. Nausea and vomiting.

5. Slow, weak pulse.

6. Muscular weakness.

7. Collapse.

Treatment.—The symptoms usually subside when the drug is stopped. If they do not disappear, they are usually relieved by bromides. If the pulse is weak, caffeine, given hypodermically, or a hot coffee enema, usually improves it.

Uses

Quinine is used principally in the following conditions:

1. **As a specific in malaria.**

2. As a bitter, to increase the appetite; and as a tonic to improve nutrition.

3. To reduce fever.

4. To destroy the amebæ, unicellular organisms which cause amebic dysentery, a chronic disease of the intestines. In these cases quinine is usually given by irrigations into the colon or large intestine.

Administration

In malaria, quinine is usually given in one single large dose of 15 grains about 4 hours before the time when the chill should occur. It may also be given in divided doses, so that the last dose is given **about the time of the expected chill**. By the time the quinine enters the blood, the parasites are very young and are readily destroyed. It may also be given in divided doses when the temperature is going down, **after the chill**. The administration of quinine should be kept up, however, for about a week after the attack is over, to prevent a recurrence of the symptoms.

1. Quinine is best given in solution after meals, since the presence of acid in the stomach aids the absorption. The addition of a drop of dilute sulphuric acid to the fluid will also aid the absorption.

Quinine is frequently given in the form of powders or pills. The pills are usually not very efficient unless they are fresh. Old quinine pills may pass out in the stools without being absorbed. The addition of a few drops of dilute sulphuric acid usually makes the quinine preparation more soluble.

QUINSY

2. On account of its unpleasant, bitter taste, quinine should be given in sherry wine, in cachets or capsules, or some food, such as olive oil, may be given afterwards.

3. For its bitter effect it should be given before meals in fluid form, undiluted.

Preparations

Fluidextract of Cinchona; dose 1 dram.

Tincture of Cinchona; dose 1 to 4 drams.

Compound Tincture of Cinchona; dose 30 to 60 minims.

The cinchona preparations are used principally as bitters to increase the appetite. For malaria and as a tonic, quinine preparations are preferable.

Quinine; dose 5 to 15 grains.

Quinine Bisulphate; dose 5 to 15 grains.

This is the most common preparation used, as it is the most soluble one.

Quinine Sulphate; dose 5 to 15 grains.

Quinine Hydrobromide; dose 5 to 15 grains.

Quinine Hydrochloride; dose 5 to 15 grains.

Cinchonine Sulphate; dose 8 to 20 grains.

Cinchonidine Sulphate; dose 8 to 20 grains.

Iron and Quinine Citrate; dose 5 to 10 grains.

Syrup of Iron, Quinine and Strychnine Phosphate; dose 1 dram.

Elixir of Iron, Quinine and Strychnine Phosphate; dose 1 dram.

Warburg's Tincture.

This is a dark brown liquid which is used extensively in India, in the treatment of malaria. It contains a large number of ingredients besides quinine, such as aloes, rhubarb, gentian, camphor, etc.

Quinine and Urea Hydrochloride; dose 5 to 15 grains.

This preparation is suitable for hypodermic use. It is also used as a local anesthetic injected hypodermically or applied to mucous membranes.

Quinine Tannate; dose 10 to 30 grains.

This preparation is slowly absorbed, and has no bitter taste.

QUINSY

See PHARYNX, and PERITONSILLAR ABSCESS.

R

RABIES

See **HYDROPHOBIA**.

RADIUM

Radium is a chemical element obtained from Hungary. The salt commonly used in medicine is **radium bromide**. This usually comes in sealed glass tubes enclosed in gold, silver or platinum. Radium differs from other chemical substances in a very singular way. It is constantly giving off atoms in the form of invisible rays which are capable of producing energy and destroying tissue. Substances which have this property are said to be **radio active**. The constant loss of the atoms takes place so slowly that the action of the radium is not materially lessened by constant use.

The active rays of radium are able to destroy tissues and are of three kinds: *alpha*, *beta* and *gamma* rays. The *gamma* rays are the most penetrating and are able to reach deep tissues, while the *alpha* and *beta* rays affect only the superficial cells. The *alpha* rays may be screened off by interposing a piece of paper between the radium and the tissue to be affected, and the *beta* rays by a thin piece of lead.

Action

Radium acts only locally, on direct application to the tissue to be treated. If a tube of radium is applied for some time on the normal skin, it will produce a red and tender area with the formation of a scab. A longer application, or a stronger tube, will form an ulcer which heals readily, however.

When applied for some time to a cancer, radium destroys some of the cancer cells, checks its growth and relieves the pain.

Uses and Administration

Radium is used principally in the treatment of cancer and rodent ulcer (a peculiar progressive form of ulcer which spreads over the face and destroys the various tissues).

RECTAL FEEDING

It is usually applied by inserting the gold, silver, or platinum covered tube of radium into the cancer tissue or by placing it on the ulcer.

Thorium and **Mesothorium** are two other radio active substances that are used in the treatment of cancer. They are much cheaper than radium but not as active.

Radium Emanation

Radium emanation is a gas which is constantly being given off from radium. It is obtained by placing a radium-containing substance in a bottle of water and allowing it to stand for some time, when the water becomes charged with the emanation. This is used as a drink in chronic rheumatism and gout with beneficial results.

The gas may also be collected from the surface of the water and used as an inhalation in the treatment of diseases of the lungs.

RECTAL FEEDING

Rectal feeding is used when the other organs of digestion are impaired to such an extent as to render the need of more food obligatory. Many investigators believe that rectal feeding is absolutely useless, while others have firm faith in its efficacy.

Technique of Rectal Feeding.—The rectum should be cleansed by flushing with a soapsuds enema one hour before nutrient enema is given. This should be done once a day, in the morning. The cleansing enema may be either soapsuds, a solution of bicarbonate of soda, or boric acid (1 teaspoonful to the pint), or a saline solution. When there is much mucus, or if the rectum is inflamed, the soda or boric acid solution may be more soothing than the saline or soapsuds enema. After one hour's rest the patient should be given a nutrient enema.

The method of administering nourishment through the rectum is important. A nutrient enema injected only into the lower bowel not only does no good, but may actually cause a good deal of unnecessary discomfort to the patient.

Temperature of Enema.—Care must be taken not to have the temperature of the nutrient enema too hot or too cold or it will be promptly rejected. The patient is placed on the side with one knee flexed; the solution is poured into a fountain syringe bag or an enamel container (heat the container before pouring the solution into it or the latter will be chilled). The bag or container has attached to it a rubber tube with a cock adjusted so that only a small stream will flow in at a time. To the end of this tube a rubber rectal tube or catheter—1 cm. (about $\frac{1}{2}$ inch)—is attached.

RECTAL TUBE

This should be well greased (do not use glycerin as this substance is irritating to the mucous lining of the rectum). The liquid should be allowed to fill the tube before it is inserted into the rectum, to prevent any air passing in with it. The tube should be inserted with a gentle twisting movement, using very little force or the tender mucous membranes will be injured. Insert the tube twelve or more inches, since the solution is more completely absorbed if given high up in the bowel. The bag containing the solution should be held only a few inches higher than the rectum, thus allowing only a small stream to pass in and allowing an air space above the stream for the passage of gas which may be accumulated in the upper part of the rectum. The tube should be allowed to remain in the rectum for fifteen or twenty minutes, then very gently withdrawn to prevent the liquid from being rejected. A pad of gauze may be pressed against the anus to assist the patient in retaining the enema. It is well to divert the attention of the patient also, to further assist her in retaining the liquid.

Duration of Rectal Feeding.—Rectal feeding cannot be substituted for a great length of time, first, because the patient cannot absorb sufficient nourishment in this way to fully cover the body requirements, and, second, because the rectum becomes more or less sensitive and will reject the liquid before it has an opportunity to be absorbed. From three to four nutrient enemas a day is about the limit for the average patient. Between the nutrient enemas it is advisable to give one of saline solution.

The following régime is practiced during the "Total Abstinence Period" in the treatment of gastric ulcer: 7 A.M., cleansing enema; 8 A.M., nutrient enema; 1 P.M., nutrient enema; 3 P.M., saline enema; 6 P.M., nutrient enema. One saline and one nutrient enema may be given during the night if the patient is very weak. She should not be wakened, however, to be given the enema.

RECTAL TUBE

See TYMPANITES, POST-OPERATIVE.

RECTOCLYSIS

See RECTUM, ADMINISTRATION OF MEDICINES BY.

RECTUM, ADMINISTRATION OF MEDICINES BY

Remedies are given by rectum for the following effects:

1. To move the bowels.
2. To medicate diseased condition of the rectum, sigmoid or colon.
3. For absorption, to cause general effects.

RESINS

Enema: For a cathartic effect the object of injecting a fluid into the rectum is merely to distend the bowels. This starts peristalsis and causes movements of the bowels. Drugs are usually given for this effect by means of an enema. When it is desired to inject fluid into the sigmoid or descending colon the patient should be placed in the knee elbow position.

Irrigation: To affect the mucous membrane of the rectum or descending colon or to remove gas or fluid, irrigations are used. The method consists of injecting fluid into the rectum and siphoning it back. An ordinary enema can, with a tube and tip, is used. The lubricated tip is inserted into the rectum, the fluid is allowed to run in and is then siphoned back by alternately elevating and lowering the can. Every time the can is lowered below the level of the patient the fluid should return from the rectum.

An excellent method of irrigating is by means of Kemp's irrigating tube, which consists of an inflow and outflow tube in one. The inflow tube is connected with the can by means of a rubber tube. When the fluid is allowed to run into the rectum it returns through the outflow tube.

For absorption: Remedies are frequently given by rectum for absorption, in cases where it may not be possible or where it is harmful to administer them by mouth. They may be given in the form of suppositories which consist of cocoa butter impregnated with the drug. These are inserted into the rectum, the cocoa butter dissolves, is absorbed and carries the drug with it into the blood stream.

Substances are absorbed more readily from the rectum, however, when given by the **Rectoclysis** or **Murphy** method. The method is the same as an irrigation, but a return flow is not desired. The essential feature of this method is to allow the fluid to run in slowly, drop by drop, so that it is absorbed and does not distend the intestine. The drug to be administered should be dissolved in a large quantity of water (about a pint to a quart). Normal salt solution should not be used as a solvent as it is not absorbed as readily as water. Many remedies, such as the salicylates, are occasionally given by this method.

RENAL CALCULUS

See KIDNEYS, SURGICAL CONDITIONS OF.

RESINS

Resins are thick, sticky substances which form the sap of many trees. Most of these substances can be dissolved in alcohol but not in water. Some resins are solid; for example, the rosin used by violinists.

RESORCIN

RESORCIN

Resorcin or **resorcinol** is a chemical substance made from carbolic acid.

The action of resorcin is like that of carbolic acid.

Local action: Applied to the skin it checks the growth of bacteria; acting as an antiseptic and disinfectant.

When given internally it produces the following effects:

1. It checks the growth of bacteria in the stomach and intestines.

2. It reduces temperature, and increases perspiration.

3. It makes the pulse slower.

Overdoses of resorcin produce the same poisonous effects that result from carbolic acid poisoning.

See **CARBOLIC ACID**.

Uses

Resorcin is used principally as an antiseptic in skin diseases, such as dandruff, baldness, etc. It is occasionally used as an intestinal antiseptic and to reduce temperature. Dose 5 to 10 grains.

Externally resorcin is used in 5 to 10 per cent. solutions.

RESPIRATIONS

What to Observe when Taking the Respirations.—A nurse must observe the rate and character of the respirations, the movements and expansion of the chest and abdomen, the color of the patient, and the position he may instinctively assume.

The Rate of the Respirations.—The average rate for a healthy adult is from 14 to 18 per minute, but it is greater in childhood (20 to 25) and in infancy (30 to 40). In health there is a uniform relation between the frequency of the pulse and of the respirations in the proportion of one respiration to four or five pulse beats. In health the respirations increase in rate and force under the same conditions as the heart to meet the needs of the body, but in disease this relation may cease. The respirations are usually increased with the pulse, but not always in equal proportions.

The Character of the Respirations.—Respirations are described as “deep” or “shallow,” depending upon whether the volume of air inspired and expired is greater or less than normal. “Rapid” respirations are usually “shallow.” Whatever interferes with the proper expansion of the chest, or with the inlet or outlet of air, or with the functioning area of the lungs, will decrease the volume of air inspired or expired.

See **CHEYNE-STOKES RESPIRATION**.

RETAINED PLACENTA

RESPONSIBILITY

See INSANITY, LEGAL ASPECT.

REST CURE

See PSYCHONEUROSES.

RETAINED AND ADHERENT PLACENTA

A **retained** placenta is one which has been separated from the wall of the uterus, but is not expelled owing to the weakness of the uterine contractions. Its presence prevents complete retraction of the uterus, which is already somewhat atonic, and there is usually a good deal of hemorrhage.

An **adherent** placenta is one which has failed to separate after an hour in spite of active uterine contractions. This abnormal adhesion of the placenta is rarely, if ever, complete. There is almost always some amount of separation, and therefore some amount of bleeding. If the adhesions are general all over the placental area, there is no hemorrhage; but if a portion separates while the rest remains adherent, the complete retraction of the exposed part of the placental site is interfered with, and post partum hemorrhage follows.

Treatment.—If the placenta fails to come away spontaneously within forty minutes or an hour after the birth of the child, an attempt should be made to express it by Crede's method. Failure to expel it by this method, carefully and correctly performed once or twice on an actively contracting uterus, indicates some abnormal adherence. In these cases the placenta must be removed by hand.

In all cases, if there is post partum hemorrhage, and the placenta cannot be expelled by Crede's method, it must be removed by hand without delay.

With strict aseptic precautions, and more especially since the adoption of sterilized rubber gloves, the risk of the procedure has been greatly diminished. The patient should be brought to the edge of the bed, and the vulva thoroughly washed with an antiseptic lotion. The right hand, similarly cleansed, should be slipped into a sterilized rubber glove, and dipped in a weak solution of lysol or other sterile lubricant. The hand should then be passed gently into the uterus, following up the cord, and the edge of the placenta sought for, the fundus being meantime pressed down by the other hand on the abdomen. The gloved fingers should then be insinuated by a sawing movement between the placenta and the uterine wall, and the whole placenta gradually separated and removed. After its removal the hand should be again introduced to make sure that no small bits

RETENTION OF URINE

have been left behind, and, if so, to remove them. This again should be followed by a hot antiseptic douche and a hypodermic injection of ergot or pituitary extract.

RETENTION OF URINE

See URINE, RETENTION OF.

RETROVERSION

See UTERUS, MALPOSITIONS OF.

RHAMNUS PURSHIANA

See CASCARA.

RHATANY

See KRAMERIA.

RHEUMATIC FEVER

In the nursing care of *acute rheumatic fever*, we have to consider a patient suffering from an acute, local inflammatory process in the joints with excruciating pain, stiffness, and swelling, and also from fever and general toxemia with pyrexia, thirst, loss of appetite, constipation, scanty, very acid urine and profuse sweats having a sour odor.

The *complications* to be feared are endocarditis, pericarditis, myocarditis, pneumonia, pleurisy, hyperpyrexia, and nervous complication—delirium, coma, stupor, prostration and chorea due to the concentration of the poisons on the nervous system.

The *room* selected should be sunny, cheerful and well ventilated. The *patient* should be protected from drafts and from changes in the temperature. He should wear a flannel gown, and if he perspires freely should lie between blankets to prevent chilling from the drenching sweats and to avoid the clammy, sticky feeling of wet sheets. The shoulders should be well protected. The gown should be open down the front and sleeves (if the arms are involved) to allow applications with the least amount of disturbance.

The *care of the skin* is extremely important on account of the sour odor and irritating quality of the acid sweats. The care of the buttocks is also important on account of the sweat and acid urine. Alkaline baths, alcohol rubs and keeping the skin dry with powder will keep the skin in good condition.

The *care of the mouth* is the same as in all fevers.

The *diet* and care regarding proper *elimination* are also much the same. When the salicylates are given, constipation is particularly to be avoided on account of the danger of acidosis.

RHUBARB

Rest, not only of the painful extremity, but of both mind and body, is absolutely essential. Cardiac complications are to be feared with the mildest attack. All causes of restlessness and sleeplessness are to be avoided. The disease is acute and apt to be prolonged so that the patient needs all his energy.

The relief of pain is necessary to secure rest and sleep and if pain is not relieved, it will wear the patient out. Every movement may mean pain and even without movement the pain may be severe. Extreme care should be used in making the bed, in turning, lifting, or moving the patient, in the use of the bedpan, and in the application of treatments, etc. Avoid even touching or leaning on the bed unnecessarily—the patient will often scream with alarm at the mere thought. A cradle is used to support the weight of the bedclothes. Pain is relieved by *rest*, *position*, the local application of *heat*, *cold*, *counterirritation*, and by the use of *drugs*. *Heat* may be applied by simply wrapping the limb in lint, cotton or flannel bandages, or in the form of fomentations, the cautery, thermal light rays or antiphlogistin. When applying heat, the joint should be protected from changes in temperature. *Cold* is applied in the form of an ice-bag, ice-coil or cold compresses. Various soothing lotions, such as lead and opium, are frequently ordered. *Methyl salicylate* is applied as a rubefacient. *Cantharides* may be used in the form of the *fly blister*.

The *drugs* used chiefly to relieve pain are preparations of *salicylic acid*, which is antiseptic, antipyretic, and also anodyne. Commonly used preparations are sodium salicylate, aspirin, salicin and methyl salicylate.

Acute Rheumatism in Children is said to be the cause of practically all the heart diseases. It differs from that in the adult in that the joint involvement is less severe, sweating is less profuse, but the heart suffers more. Chorea is also more common. Watch for twitching, fidgety, vague, jerky movements. The mental attitude is apt to be unstable, so that the child is easily upset or excited and laughs or cries easily. Rest, quiet, and very careful nursing are essential.

RHUBARB

Rhubarb is obtained from the root of the *Rheum officinale*.

Rhubarb acts principally upon the large intestine as a purgative, producing frequent fluid stools, not accompanied by griping. These stools are colored with bile. On account of the tannic acid which it contains, rhubarb constipates after its purgative action.

The urine, and in nursing women, the milk, is colored yellow when rhubarb is taken.

RHUS GLABRA

Rhubarb is particularly valuable in cases where solid masses in the stools produce pain. For example, in hemorrhoids, by softening the stools, the pain produced by the passage of hard fecal masses, is often relieved.

Preparations

Extract of Rhubarb; dose 5 to 10 grains.

Compound Rhubarb Pill; dose 1 to 5 pills.

This contains aloes, myrrh, oil of peppermint and rhubarb.

Compound Rhubarb Powder (Gregory's powder); dose 15 to 60 grains.

This contains magnesia, ginger and rhubarb.

Aromatic Syrup of Rhubarb; dose $\frac{1}{2}$ to 2 drams for a child.

Rhubarb and Soda Mixture; dose 2 drams.

This also contains ipecac and is used more for stomach conditions than as a cathartic.

RHUS GLABRA (SUMACH)

Rhus glabra is obtained from the fruit of **Sumach berries**. It contains tannic and malic acids.

It is used as an astringent gargle, diluted in two parts of water, for sore throat and pharyngitis.

RICKETS

Rickets is a constitutional disease, due to disturbed nutrition, developing in infancy and early childhood, generally between the sixth and eighteenth months. The exact cause of this disease is still unknown, but it is much more common in artificially fed infants than those receiving breast milk. This may be due to the fact that the mineral salts, like the other constituents, are combined in the mother's milk in measures which meet the needs of the baby more efficiently than is the case in cow's milk. The metabolism of the phosphorus and calcium in rickets is interfered with, and the bones of babies suffering from this disease show a diminished amount of calcium and phosphorus and an increased amount of water. As the disease progresses the bones bend into deformities, owing to the lack of calcium, which gives rigidity and permanence to the skeleton.

Dietetic Treatment.—The treatment of rickets is essentially one of diet. There is no doubting the fact that good breast milk is the best food in this condition, as it is in all nutritional disturbances, but when it is impossible to secure it for the baby, the next best thing is a properly modified milk formula. This formula must be made to suit the digestive capacity of the individual infant at the time. It

RUSSIAN MINERAL OIL

is believed, however, "that it is well to keep the percentage of fat lower and that of the carbohydrates higher than would ordinarily be done." This is probably done on account of the effect upon the retention of calcium and phosphorus in the body of the infant exerted by the different food constituents.

Calcium in the Diet.—In cow's milk the calcium content is in excess of the needs of the baby, hence there is no reason whatsoever to give the rachitic baby additional calcium. If the baby is not breast fed or is not receiving a modified cow's milk, then he may not receive sufficient calcium for his needs, in which case the diet must be changed to one or the other. Care must be observed not to give too rich a food, since in this way the baby's ability to handle a sufficient amount would so limit the calcium intake as to make it insufficient.

Excess Fat and Calcium Retention.—As has already been mentioned, it is probable that an excess of fat in the food may interfere with the calcium retention, on account of the combining of the salts and the fats and in this way interfering with the absorption of the former substance.

Fresh air and plenty of sunshine are necessary in the treatment of rickets. In some cases where anemia is pronounced, it is found advisable to give some form of iron.

RINGWORM

See SKIN DISEASES.

ROCHELLE SALT

See SALINE PURGATIVES.

ROSE (ROSA GALLICA)

Rosa gallica is made from red rose petals, gathered from the unopened buds. It is used as a mild astringent and as a flavoring ingredient. It usually comes in the form of a fluidextract, a honey, a syrup, and a confection, for flavoring purposes.

For local use, the following preparations are used:

Rose Water; Stronger Rose Water; Cold Cream or Rose Ointment.

RUBEFACIENTS

See COUNTERIRRITANTS.

RUM

See ALCOHOL.

RUPTURE

See HERNIA.

RUSSIAN MINERAL OIL

See LIQUID PETROLATUM.

S

SABROMIN

Sabromin is an organic salt formed by the combination of calcium and dibrombehenic acid. It produces the same effects as the bromides, but they come on slower and last longer. It is said to have a more pleasant taste and not to upset the stomach. It usually comes in tablets, each containing 8 grains. The dose is from 8 to 60 grains.

SACCHARIN

Saccharin is a chemical substance which has a very sweet taste. It is 200 times sweeter than sugar and is used to sweeten foods for diabetic patients. It is usually given in half grain doses together with 5 grains of sodium bicarbonate, since it dissolves more readily in alkaline solutions.

SACCHARUM LACTIS

See SUGAR OF MILK.

SALICIN

See SALICYLIC ACID.

SALICYLIC ACID AND THE SALICYLATES

Salicylic acid is a white crystalline powder which is made chemically by the action of sodium hydroxide (caustic soda) and carbonic acid, on carbolic acid.

The **salicylates** are salts formed by the combination of an alkali with salicylic acid.

Many salicylates are found in various plants. For example, methyl salicylate is found in the **oil of wintergreen**, or **oleum gaultheriæ**.

There are many new artificial preparations made chemically from salicylic acid or its salts, some of which, such as **aspirin**, are extensively used.

Appearance of the Patient

About 15 minutes after an average dose of salicylic acid, or one of the salicylates, is given, the patient complains of

SALICYLIC ACID

a slight burning pain in the pit of the stomach, and possibly of a slight feeling of fullness in the head. Soon he sweats profusely, and the temperature is lowered 1 or 2 degrees, particularly if there is fever. The pulse may be somewhat faster and stronger, unless a large dose has been given, when it may be slightly slower and weaker. The breathing is usually somewhat more rapid, and the patient passes more urine.

If the patient is suffering from acute articular rheumatism, the pains and swellings around the joints are gradually relieved.

Local action: Salicylic acid and the salicylates are antiseptics. They also soften the epidermis or hard layer of the skin when directly applied. **On mucous membranes,** they cause redness and increased secretions (irritation).

Internal Action.—In the mouth: They have a peculiar salty, sour taste.

In the stomach: Salicylic acid and the salicylates increase the secretions. If given when the stomach is empty, they are apt to cause burning pain in the stomach, occasionally nausea, and possibly vomiting.

In the intestines: They have an antiseptic action, checking the growth of bacteria.

Effect of Salicylates

Salicylic acid and the salicylates are used principally as specifics for acute articular rheumatism; the pains become lessened in a few days, the redness and swelling of the joints are diminished, the temperature subsides, and the patient soon gets well.

Effect on temperature: The salicylates reduce the temperature several degrees in fevers, because of the increased elimination of heat which results from the profuse sweating and dilated blood vessels of the skin. The temperature begins to go down in fifteen minutes, and stays down for about six hours. The normal temperature is not affected, however.

Action on the secretions: The salicylates increase the secretion of sweat especially. About fifteen minutes to a half hour after a dose of one of the salicylates is given, the patient is usually covered with profuse perspiration.

Action on the circulation: The salicylates usually make the pulse somewhat faster and stronger at first, by increasing the contractions of the heart muscle and contracting the blood vessels.

With larger doses, the contractions of the heart muscle are soon weakened and the pulse becomes slower and weaker.

SALICYLIC ACID

Excretion

The salicylates are eliminated from the body as **salicyluric acid**, mainly by the urine; usually in several hours. Some of the drug is also excreted in the perspiration, milk and bile.

Poisonous Effects

Large doses of salicylates often cause quite alarming symptoms, especially if used for a long time, but they are rarely fatal. The symptoms resemble those of quinine poisoning.

Symptoms.—Overdoses of salicylates cause the following symptoms:

1. Buzzing and noises in the ears, and a feeling of fullness in the head.

2. **Deafness.**

3. Dimness of vision.

4. **Profuse perspiration.**

5. Feeling of warmth all over the body.

6. **Occasionally nausea and vomiting.**

In severe cases besides these symptoms there are usually:

7. Dyspnea, rapid, irregular, deep and labored breathing.

8. Collapse (slow, weak pulse, subnormal temperature, cold, moist skin, etc.).

9. Unconsciousness.

10. Occasionally the patient becomes delirious or even maniacal, and he often seems to see various objects about him (hallucinations of sight) or he seems to hear voices (hallucinations of hearing).

Death has rarely resulted from salicylate poisoning.

Treatment.—1. If the drug is stopped, the symptoms usually disappear in a few days or a week.

2. Caffeine, strychnine, or other heart stimulants are usually given, if the pulse is weak.

Administration

Salicylic acid or the salicylates, are best given in capsules, tablets or in a small quantity of milk or syrup, about an hour or two after meals.

They are best given with sodium bicarbonate to overcome the pain in the stomach, or the nausea and vomiting which may result from the rapid formation of salicylic acid in the stomach.

Preparations

Salicylic Acid; dose 5 to 30 grains.

This is more readily dissolved in hot water or in a solution of boric acid or borax.

Sodium Salicylate; dose 5 to 30 grains.

SALINE BATHS

This is more soluble than the salicylic acid and is not so apt to upset the stomach.

Lithium Salicylate; dose 5 to 30 grains.

Ammonium Salicylate; dose 5 grains.

Strontium Salicylate; dose 15 grains.

Oil of Wintergreen (Oleum Gaultheriæ); dose 5 to 15 minims.

This is a volatile oil obtained by distilling **Gaultheria procumbens** or wintergreen. It contains 90 per cent. of methyl salicylate and is given in an emulsion or in capsules. It acts like the salicylates, but it occasionally causes nausea and vomiting.

Methyl Salicylate; dose 5 to 15 grains.

This is artificial oil of wintergreen. It is contained in oil of wintergreen and oil of sweet birch.

Salicin; dose 5 to 30 grains.

Salicin is a glucoside obtained from the bark of various species of willow and poplar trees. It is changed to salicylic acid in the body and it then produces the same effects.

It has a very bitter taste and is not as reliable in its action as the other preparations.

Salol (Phenylis Salicylas); dose 5 to 30 grains.

Salol is a tasteless powder which is decomposed in the intestine, into salicylic and carbolic acids. The salicylic acid is absorbed into the blood from the intestines, and it then produces the same effects as the salicylates. It is frequently used as an intestinal and urinary antiseptic. Symptoms of carbolic acid poisoning occasionally result from the carbolic acid which is formed in the intestines.

Aspirin (Acidum Acetylsalicylicum); dose 5 to 15 grains.

This is a compound made chemically from salicylic acid. It is absorbed in the intestines and then acts like salicylic acid, but because it is very slowly absorbed, its effects are more lasting.

Novaspirin; dose 5 to 15 grains.

It acts like aspirin but is said not to upset the stomach.

SALINE BATHS

These are artificially prepared sea-water baths.

Composition of the Bath.—Eight pounds of sea-salt to thirty gallons of water, or by using five to eight pounds of ordinary salt, practically the same effects may be produced. For partial baths use four ounces to one quart.

The *temperature of the bath* is usually 70° F. The *duration* is usually ten minutes, with friction during and after the bath.

Effects of the Bath.—Sea-water feels much warmer than fresh water because the salts present irritate or stimulate

SALINE DIURETICS

the nerves in the skin and so hasten the reaction, or, the increased flow of blood in the skin and the feeling of warmth and comfort. This makes it possible to give the saline bath two or three degrees lower than that of the fresh water bath usually tolerated by the patient, so that both the desired circulatory reaction and the tonic effects of the thermic reaction are produced. The usual precautions are taken to avoid chilling or exhaustion. After the bath the patient should be wrapped in a warm sheet and brisk friction applied.

SALINE DIURETICS

Action on the kidneys: The effect of the saline diuretics on the kidneys is to increase the flow of urine, and results from their absorption. They increase the salt concentration of the blood, and therefore its osmotic power. As a result, fluid is withdrawn into the blood from the tissues, and the fluid content of the blood is increased. This excess of fluid is then eliminated by the kidneys, thus increasing the secretion of urine.

Administration

The saline diuretics should be given well diluted in the morning when the stomach is empty.

Preparations

Potassium Acetate; dose 10 to 60 grains.

Potassium Bitartrate (Cream of Tartar); dose 10 to 60 grains.

It is usually given in hot water, flavored with lemon juice.

Potassium Citrate; dose 10 to 20 grains.

This is not as unpleasant to take as the other potassium salts. It increases the secretion of sweat (diaphoretic action), as well as the secretion of urine.

Solution of Potassium Citrate; dose 4 to 8 drams.

This contains about 8 per cent. of potassium bicarbonate, and about 6 per cent. of citric acid.

Effervescent Potassium Citrate; dose $\frac{1}{2}$ to 1 dram.

This consists of potassium citrate 20 per cent., potassium bicarbonate and sugar.

Effervescent Draught.

This is made by adding 1 ounce of potassium bicarbonate to 1 ounce of lemon juice.

Other potassium salts which are occasionally used as diuretics, are potassium bicarbonate, potassium carbonate, potassium chlorate and potassium sulphate.

Sodium Acetate; dose 10 to 60 grains.

Lithium Benzoate; dose 5 to 15 grains.

Lithium Carbonate; dose 5 to 15 grains.

SALINE PURGATIVES

Lithium Citrate; dose 5 to 15 grains.

Effervescent Lithium Citrate; dose 1 to 2 drams.

This contains citric acid, lithium carbonate, sodium bicarbonate and sugar.

SALINE PURGATIVES

Saline purgatives are inorganic (mineral) salts used as purgatives. They are all combinations of alkalis with acids. Only those salts are used which are not readily absorbed. The saline purgatives all act on the entire intestine.

Action

Locally: The saline purgatives produce no effect.

In the mouth: Most of the saline purgatives have a harsh, unpleasant bitter taste.

In the stomach: They often produce nausea and vomiting.

In the intestines: They produce frequent fluid stools accompanied by griping.

Since the withdrawal of fluid from the tissues takes considerable time, bowel movements from concentrated salt solutions may occur only after ten or twenty hours. On the other hand, dilute solutions, because they are not absorbed, but merely distend the intestines, usually induce much more rapid effects.

The saline cathartics are particularly valuable in cases where there is a great deal of fluid in the tissues (edema), for example, to reduce edema of the legs in nephritis, or to reduce ascites (fluid in the abdomen). In such cases they withdraw the fluid from the tissues into the intestines, and the frequent movements of the bowels which result, eliminate this excessive fluid, relieving the edema or the ascites.

Saline cathartics are also given to reduce blood pressure, because they withdraw fluid from the blood. By lessening the total quantity of blood in the body, blood pressure is reduced.

The saline cathartics should not be given in cases where there are ulcers or inflammation in the intestines, as they may aggravate this condition.

A small portion of each dose of some of the salines is absorbed, and acts on the kidneys as a diuretic, increasing the flow of urine.

Administration

The saline cathartics are best given well diluted, preferably in the morning, when the stomach is empty. They move the bowels in a few hours.

To relieve edema they should be given in a concentrated

SALINE PURGATIVES

solution, since more fluid is thus removed, and the effect is more prolonged.

The preparations of the saline purgatives are best given in cold seltzer or vichy. If they are given hot, the addition of 10 or 15 drops of tincture of ginger makes them taste more agreeable. They should not be given stronger than 5 to 10 per cent. solutions.

Preparations

Sodium Sulphate (Glauber's Salt); dose $\frac{1}{2}$ dram to 1 ounce.

This is soluble in 3 parts of water. This is best given in solution not stronger than 5 to 10 per cent.

Sodium Phosphate; dose 15 grains to 1 ounce.

This is soluble in 6 parts of water. It is best given in milk, not stronger than 5 to 10 per cent. solutions.

Potassium Sulphate; dose 15 to 60 grains.

Potassium Bitartrate (Cream of tartar); dose 15 to 60 grains.

Potassium and Sodium Tartrate (Rochelle Salt); dose 2 to 4 drams.

This is soluble in $1\frac{1}{2}$ parts of water. It tastes pleasanter than Epsom salts.

Magnesium Oxide, Calcined Magnesia, or Light Magnesia; dose 1 dram.

Effervescent Preparations

These preparations of the salts form gas (effervesce) when dissolved in water.

Seidlitz Powder (*Pulvis Effervescens Compositus*);

This is made up in two powders:

1. The powder wrapped up in **blue paper** contains:

Sodium Bicarbonate	grs. xl
Rochelle Salt	ʒii

2. The powder wrapped up in **white paper** contains:

Tartaric Acid	grs. xxv
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A seidlitz powder should always be administered at the bedside. Each powder should be dissolved in half a glass of water, the two solutions mixed and the mixture given to the patient.

The combination of the tartaric acid and sodium bicarbonate forms carbon dioxide gas, which causes the effervescence. Seidlitz powder is often given to distend the stomach, for diagnostic purposes.

Solution of Citrate of Magnesia; dose 5 to 12 ounces.

This is a solution of magnesium citrate and citric acid, to which potassium bicarbonate is added. It is usually kept

SALVARSAN

in tightly closed bottles, and effervesces when it is poured in a glass.

Effervescent Magnesium Sulphate; dose 4 to 8 drams.

This contains Epsom salt, sodium bicarbonate, tartaric and citric acids. The mixture effervesces when mixed with water.

Effervescent Sodium Phosphate; dose 2 drams to 2 ounces.

This contains sodium phosphate, sodium bicarbonate, tartaric and citric acids. The mixture effervesces when dissolved in water.

Effervescent Lithium Citrate; dose 1 to 2 drams.

This contains lithium citrate or lithium carbonate, sodium bicarbonate and citric acid.

All the effervescent preparations, if not already in solution, should be given in a tumblerful of water.

See CATHARTICS.

SALIPYRIN

See ANTIPYRIN.

SALOCOLL

See PHENOCOLL.

SALOL

See SALICYLIC ACID.

SALPINGITIS

See FALLOPIAN TUBES.

SALVARSAN

Salvarsan, arsphenamine, arsenobenzol, or "606" is a complex organic arsenic salt. It is a yellow powder which comes in a sealed glass tube together with nitrogen gas, since it is readily changed by the oxygen of the air.

Action

Salvarsan is a specific for all stages of syphilis. It combines with, and destroys, the *Spirochæta pallida*, the organism which causes the disease. In a few weeks after the administration of the remedy, there is a remarkable and prompt disappearance of all the symptoms of the disease, such as the initial sore, the rash, the mucous patches and the other manifestations. The patient is not considered cured, however, until the examination of his blood shows that he is free from the disease. The administration of the remedy is therefore repeated at weekly intervals.

Salvarsan has also been used with success in the treatment of malaria and other infectious diseases resulting from the circulation in the blood of parasitic organisms, such as those of relapsing fever, frambesia, etc.

SANDBAGS

Neosalvarsan is not as efficient as salvarsan, therefore it must be given in larger doses, but it is easier to administer.

Idiosyncrasies

1. Symptoms of arsenic poisoning may result.
2. The rash may temporarily become more intense, there may be a rise in temperature, headache and ringing in the ears (Herxheimer's reaction).

Administration

1. Salvarsan is usually given by direct injection into the veins, as an intravenous infusion. The remedy must be very carefully neutralized with an alkali, such as potassium hydroxide, and then dissolved in about 250 to 300 c.c. of sterile, distilled water or saline solution, and the resulting solution is then allowed to slowly run into the veins.

It is also given by deep injections into the muscles.

2. Neosalvarsan is dissolved in sterile, distilled water, about 25 c.c. being used for every 0.1 gm. of the drug.

It is given like salvarsan, by injection into the veins, or into the muscles.

Neosalvarsan is only half as strong as salvarsan. It does not have to be neutralized with an alkali.

Preparations

Salvarsan or "606" (**Arsphenamine**, or **Arsenobenzol**); dose 5 to 10 grains.

This contains about 31 per cent. of arsenic.

Neosalvarsan; dose 10 to 14 grains.

See **ARSENIC**.

SANDBAGS

Sandbags of different sizes are used extensively for restraint or support in maintaining certain positions. They are also used to limit motion and relieve pain due to the twitching of muscles. They are sometimes covered with stout ticking but are more satisfactory when covered with rubber as they are easily cleansed and disinfected. When covered with ticking, washable covers must be provided. An extremity or other part of the body may be restrained by covering it with a towel and placing sandbags over the ends of the towel and fitting snugly against both sides of the limb. This will prevent both lateral and upward movement.

SANTONICA (LEVANT WORMSEED)

Santonica or **Levant wormseed** is the dry unopened flower heads of the **Artemisia pauciflora**, a plant growing in Asia Minor. Its active principle is a crystalline substance

SANTONIN

called **santonin**, though it also contains a similar substance called **artemisin** and a volatile oil, **cineol**.

Action

Santonin has a bitter taste and is partly dissolved in the stomach. Here some of it is absorbed into the blood. Most of the santonin then passes out into the small intestine, where it destroys round worms, or *ascaris lumbricoides*.

The absorption of some of the santonin, causes, in many cases, a very characteristic and peculiar disturbance of vision known as **xanthopsia**, or "yellow vision."

At first all objects seem to have a blue color, but this effect lasts for a very short time, and is soon followed by a condition where all objects seem to have a yellow tint; thus, blue seems green; and violet cannot be seen at all. This condition lasts for several hours and is probably due to a direct poisonous effect on the retina. Occasionally there are also disturbances of the sense of taste, smell, and hearing.

Santonin is excreted by the urine, to which it gives a characteristic yellow or reddish color.

Poisonous Effects

Overdoses of santonin not infrequently cause poisonous symptoms, especially in children.

Symptoms.—1. "Yellow vision."

2. Twitchings of the muscles of the head.
3. Rolling of the eyes, and grinding of the teeth.
4. Various movements of the head, forward and backward, and from side to side. These symptoms are soon followed by:

5. Convulsions.
6. Slow, irregular breathing, especially during the convulsions.
7. Collapse (slow, weak pulse, moist, cold skin, dilated pupils, etc.).
8. Occasionally nausea and vomiting, or loss of speech (aphasia), occur.

Treatment.—The stomach should be washed out; emetics and cathartics are given. The convulsions are treated with chloroform or ether.

Preparation

Santonin, the active principle, is the drug which is principally used. Dose $\frac{1}{2}$ to 5 grains.

For a child 2 years old $\frac{1}{4}$ of a grain should be given.

See **ANTHELMINTICS**.

SANTONIN

See **SANTONICA**.

SAPONINS

SAPONINS

Saponins are glucosides which have some of the properties of soap; that is, they foam when mixed with water. They are found in a number of plants such as sarsaparilla, quillaja bark, etc. They are not absorbed, but merely act locally by injuring the tissues with which they come in contact (irritating). When given internally they cause nausea, vomiting and diarrhea. Many drugs produce these effects because of the saponins which they contain.

SAPREMIA

See SEPSIS.

SARSAPARILLA

Sarsaparilla is obtained from the roots of *Smilax officinalis*, and other varieties of smilax. Its active principles are soapy glucosides (saponins).

Action

Sarsaparilla is used principally to improve the nutrition of the body (alterative). It is said to increase the perspiration. In large doses it causes vomiting and diarrhea. It was formerly used a great deal in the treatment of the third stage of syphilis, chronic rheumatism, etc. It is occasionally used as a drink.

Preparations

Fluidextract of Sarsaparilla; dose 1 dram.

Compound Fluidextract of Sarsaparilla; dose 1 to 2 drams.

This contains sarsaparilla, licorice root, sassafras and mezereum.

Compound Syrup of Sarsaparilla; dose $\frac{1}{2}$ to 1 ounce.

This is used as an excellent vehicle in which to give potassium iodide.

SCABIES

See SKIN DISEASES.

SCALDS

See BURNS.

SCAMMONY

Scammony is the dried milky juice (resin), obtained from the root of the *Convolvulus scammonia*, a vine growing in Syria. Its active principle is jalapin, a resinous substance.

Scammony is used principally as a drastic cathartic.

Preparation

Resin of Scammony; dose 3 to 8 grains.

SCHICK TEST

SCARLET FEVER, NURSING IN

Isolate the patient, and reserve the bathroom if possible. Everything coming in contact with the patient must be kept separate. All soiled clothing, etc., must be placed at once in a disinfectant, and all gauze and discharges burned. The room should be kept at a temperature of about 70° F., and be well ventilated; but the patient must be kept warm. A warm bed bath should be given daily until three or four days after the temperature is normal, then a daily tub bath. Water absorbed assists the kidneys and aids desquamation. Extra baths may be given for extreme restlessness or for intense rash. Oil rubbed in the body aids desquamation. Keep a normal case in bed for three weeks; such a case is considered free from contagion after thirty days. Watch the urine closely as to character and amount. Any rise in temperature, earache, enlarged cervical glands, or scanty urine should be reported to the physician at once.

Diet for normal case:

First week, or until temperature is normal: Milk, fruit juice, water.

Second week, add toast and cereals.

Third week, add soup and vegetables.

Fourth week, meat may be given to adults once each day:

See INFECTIOUS DISEASES, COURSE OF.

SCHAEFER'S METHOD OF ARTIFICIAL RESPIRATION

See ARTIFICIAL RESPIRATION.

SCHICK TEST

In order to determine whether a prophylactic dose of antitoxin is necessary in case of exposure to diphtheria Schick has devised a simple skin test for detecting the presence of natural antitoxin in the blood. A minute amount of toxin (about one-fifth of the minimum lethal dose for a guinea pig) is injected intradermically. If the person receiving the toxin possess an amount of antitoxin equal to at least one-thirtieth of a unit in each cubic centimeter of blood the injected toxin is neutralized and no reaction appears; if, on the other hand, he has no antitoxin, the toxin acts as an irritant to the skin and in from twenty to forty-eight hours produces a small inflamed area. This positive reaction indicates that the person has no natural antitoxin and therefore that he is susceptible to the disease; conversely, a negative reaction indicates that an individual has in all probability sufficient natural antitoxin to protect him, even in case of exposure, and a prophylactic dose is unnecessary.

SCILLA

SCILLA

See SQUILL.

SCOPARIUS (BROOM TOPS)

Scoparius is obtained from the dried tops of the **Cytisus scoparius**, or common broom plant, which grows in Europe and the United States. Its active principles are a liquid alkaloid, **sparteine**, and a neutral substance, **scoparin**. Its diuretic action is due to the scoparin.

Action

The principal action of scoparius is to increase the flow of urine, but its effect is not very marked, however.

Preparations

Scoparius is given in the form of a decoction, made by boiling about half an ounce of broom tops in water, to make up half a pint. About one ounce of this decoction is given every 2 or 3 hours.

See SPARTEINE.

SCOPOLA

Scopola is obtained from the underground stems of the **Scopola atropoides**, a plant which grows on the hills of central and southern Europe. It acts like atropine but has a soothing effect on the brain.

Preparations

Extract of Scopola; dose $\frac{1}{4}$ to $\frac{1}{2}$ of a grain.

Fluidextract of Scopola; dose 1 to 2 minims.

Scopolamine hydrobromide is the same as hyoscine hydrobromide and is given in doses of $\frac{1}{200}$ to $\frac{1}{100}$ of a grain.

SCOPOLAMINE

See HYOSCINE, HYOSCYAMINE, and SCOPOLA.

SCOPOLAMINE MORPHINE ANESTHESIA

(Twilight Sleep)

Hyoscine or scopolamine is given together with morphine to produce a state of mild unconsciousness or anesthesia, so as to enable the performance of painless operations. It may be used alone or as a preliminary to a general anesthetic.

It has been used, however, for painless childbirth. The method, which is commonly known as "twilight sleep," consists in inducing the following effects:

1. A drowsy state in which the consciousness, as well as the sense of pain, is lessened.
2. A loss of memory for pain.

SCURVY

Method of Administration

The desired condition is brought about by giving a dose of hyoscine with morphine as soon as labor pains start. The hyoscine alone is then repeated every hour; but each time in a smaller dose.

The effect of the drug is enhanced by darkening the room and maintaining calm and quiet surroundings.

To determine whether the desired effects are obtained, the nurse should test the patient's memory about every half hour, throughout the administration: by showing the patient the same object at frequent intervals. When the patient does not remember the object seen, the desired effect is obtained. The same object should not be shown too often, however, as the test may then become unreliable. During treatment, the patient should be carefully watched, for symptoms of collapse and poisoning (atropine poisoning). Many patients are delirious throughout the treatment, although they do not remember the pains.

SCURVY

Scurvy, like rickets, is a constitutional disease, due to a disturbance of the nutrition, but the disease, while often associated with, is not synonymous with rickets.

Factors Inducing Scurvy.—Consensus of opinion proves that scurvy is caused by errors in diet; not temporary errors but errors which have continued over an appreciable length of time. In the various investigations and analyses of the diets of a vast number of cases the trouble is now believed to be due to a lack of some essential element in the food, and not to any foreign element.

Scurvy in Breast-fed Babies.—Breast-fed babies occasionally develop scurvy, but it is by no means so common in these infants as in those receiving an artificial food, whether that food consists of a milk formula or a proprietary food. Science has proved that while the heating of milk, as in pasteurizing and sterilizing and boiling, may be one of the causes of this disease, it is not the only one, since babies receiving raw milk likewise develop scurvy.

Lack of Vitamines.—Recently it has come to be believed that possibly the lack of vitamines in diet may give rise to this trouble. These substances are extremely sensitive to heat, and when babies are fed upon cooked milk and do not receive other food in which the vitamines are not destroyed by heat, they are apt to develop scurvy. It has been known for a long time that fresh fruit juices and vegetables contain antiscorbutic elements, and for this reason they have been included in the diet of children and adults who are suffering from scurvy.

SECUNDINES

Treatment.—If the baby is fed on breast milk, the diet of the mother should be changed to increase the nutrients in the milk. When proprietary foods are used they should either be made up with milk or should be eliminated in favor of a modified milk formula. The latter should be pasteurized when necessary, but as low a degree of heat used as possible to bring about the desired result. Orange juice is the simplest and most available of substances containing the necessary properties by which scurvy is relieved. This may be added to the diet after the baby is a few months old, the dose being one ounce per day, given one hour before the milk feeding when the stomach is more or less empty. It may be diluted with water and slightly sweetened if the baby will take it better so. Orange peel contains the antiscorbutic properties and has the advantage of being cheaper than oranges.

Antiscorbutic Foods.—Since scurvy yields readily to the action of the antiscorbutic properties in orange and lemon juice, it is not necessary to give vegetables to babies. However, in certain cases a boiled or baked Irish potato finely mashed and given in doses of one to two tablespoonfuls a day results in a rapid recovery.

SECUNDINES

See AFTER-BIRTH.

SEIDLITZ POWDER

See SALINE PURGATIVES.

SENEGA

Senega is obtained from the root of the *Polygala senega*, or *senega snake root*, a plant growing in the middle and southern United States.

Uses

Senega is used principally as a stimulating expectorant and somewhat as a diuretic.

Preparations

Fluidextract of Senega; dose 10 to 15 minims.

Syrup of Senega; dose 1 to 2 drams.

Senega is also contained in the compound syrup of squill.

SENNA

Senna is obtained from small dried leaves of an oriental shrub. The active principle of senna belongs to the same group of substances as aloin.

SEPSIS

Action

Senna acts principally on the large intestine, producing in five hours after it is given, frequent watery stools, usually accompanied by severe griping pains.

To overcome the griping, it is usually combined with other substances, especially carminatives.

It is excreted in the urine. In nursing women it is excreted in the milk, and it will then act as a laxative on the nursing infant.

Senna in small doses is often given to children as a laxative.

Preparations

Confection of Senna; dose 1 to 2 drams.

Containing senna, cassia fistula, tamarind, prune, fig, sugar and oil of coriander.

Compound Infusion of Senna (Black Draught); dose 1 to 4 ounces.

Contains senna, manna, magnesium sulphate and fennel.

Syrup of Senna; dose 1 to 4 drams.

Senna tea is a preparation often given to children. It is an infusion of senna leaves, made from a teaspoonful of leaves to a cup of water.

SEPSIS

Septicemia, Pyemia and Septic Intoxication.—**Septicemia** or acute general sepsis is the result of the entrance, growth, proliferation or general flooding of the blood stream with pyogenic organisms.

Pyemia is septicemia in which the organisms have gained a foothold here and there in the tissues of the body in which they deposit colonies or suppurative foci of infection (abscesses) from which bacteria are from time to time poured into the blood stream.

Septic intoxication or toxemia is due to the absorption of toxins from the suppurating wound or abscess.

Sapremia is a general poisoning due to the absorption of poisons due to the action of putrefactive organisms on dead tissue. An example of this would be puerperal sepsis due to the action of organisms on a portion of the placenta allowed to remain in the uterus after childbirth.

The **organisms** which most commonly cause septicemia are the streptococcus pyogenes, the staphylococcus aureus or albus, the pneumococcus, gonococcus, bacillus coli communis, bacillus pyocyaneus, and others.

The **symptoms** usually begin on the third post-operative day with chilly sensations or a definite chill, headache, and back-ache, and the patient feels very miserable in general. The

SEPSIS

temperature rises to 102°, 105° or 107° F. The mouth is dry, the lips parched, the tongue coated and the patient is very thirsty. The high fever may be continuous but more often there are marked remissions, rising after a chill (probably due to a pouring out or flooding of the blood stream with fresh bacteria) and falling to or below normal during the cold sweats which occur. The pulse is rapid and, as the lining and muscles of the heart and blood vessels become affected, soft, small and easily compressible. As the kidneys become affected the urine is scanty. Red cells are destroyed causing the marked pallor, and bacteria plug the capillaries with emboli, forming petechial spots. While the patient's resistance lasts there is a marked leucocytosis which falls as the general prostration increases. In fatal cases restlessness and delirium alternate with stupor which finally passes into coma before death. The local symptoms are pain and acute inflammation about the wound.

Treatment and Nursing Care.—The local treatment consists in a thorough drainage, cleansing and irrigation of the wound or focus of infection. When the symptoms are due to toxemia they subside with the local treatment but when due to general sepsis they are not relieved by the local treatment. In septicemia and pyemia the prognosis is very grave but patients have recovered with proper treatments and *skilled nursing* care. Transfusions are given to supply antibodies and to increase the patient's resistance. Hypodermoclysis and protoclysis are given to stimulate the heart, supply fluid to the tissues, relieve thirst, dilute the poisons, stimulate the kidneys and to flush the poisons and bacteria out of the system. Water is also given freely by mouth. Nourishing fluids are given by mouth or when nausea and vomiting prevent, nutrient enemata are given. Everything is done to keep up the patient's strength and resistance and to cause the elimination of the poisons. Fresh air and sunlight are essential. Everything must be done to relieve discomfort—the headache is relieved by an ice-cap, the backache by massage and by rubbing with alcohol, chills by the application of external warmth, the high fever, restlessness, delirium or stupor by cool sponging. The mouth is kept moist and clean, perspiration is removed by sponging, the gown and bed linen are kept dry and clean.

Skilled nursing care will do much toward keeping up the patient's strength and preventing him from being overwhelmed by the invasion of the bacteria.

A patient with septicemia or pyemia should be isolated from other surgical patients and every precaution taken to prevent the spread of infection. The nurse must avoid or take great care of even the slightest abrasions which she, herself, may

SERUMS

have, for bacteria may enter by the most minute abrasion, even too small to be visible, and cause a general septicemia even before the local symptoms develop.

SEPTICEMIA

See SEPSIS.

SEPTIC INTOXICATION

See SEPSIS.

SEPTUM DEVIATED

See NOSE.

SEQUESTRUM

See OSTEOMYELITIS.

SERUM SICKNESS

See ANAPHYLAXIS.

SERUMS

When a patient suffers from an infectious disease, and then recovers, the disease has been overcome by the formation in the blood of antibodies against the causative agent of that particular infection. The patient is then said to have developed an **active immunity** against the disease, because he himself has formed the antibodies.

Similarly, when an animal is injected with bacteria or their poisonous excretions (toxins) in gradually increasing doses, the animal develops an active immunity against the injected bacteria or their toxins. The **serum** of such an animal can then be injected into patients to overcome a similar infection. As a result of the injection the patient becomes immunized against the disease. Immunity produced in this way is called **passive immunity** because it was the result of antibodies formed in the blood of another animal.

Serums are usually given hypodermically or intramuscularly; for immediate effect some are injected intravenously.

A **serum** is the serum of an animal that has been immunized against a particular bacterium or its toxins. Serums are of two kinds: **bacteriolytic**, and **antitoxic**.

Bacteriolytic Serums

A **bacteriolytic serum** is the serum of an animal that has been immunized against particular bacteria. The horse is the animal commonly used for the manufacture of serums since the largest quantity of serum can be obtained from this animal.

Method of Manufacture

A horse is injected with a small dose of a solution of the particular bacteria against which the serum is desired. The

SERUMS

horse then becomes ill and has a rise of temperature, which disappears in a few days. When the animal is well again, the injection is repeated, but with a larger dose; which now does not produce such severe symptoms.

The injections are repeated until the animal can stand injections of large doses of the bacteria without any symptoms being produced. The horse is then immune against these particular bacteria, and his serum contains antibodies against the bacteria with which he was injected. The animal is then bled from the jugular vein, the blood is allowed to clot, and the serum is removed under strictly aseptic precautions. This serum, when injected into patients suffering from an infection produced by the same bacteria, neutralizes their poisonous effects; the antibodies of the serum combining with the bacteria.

Preparations

Antistreptococcus Serum, used in the treatment of septicemia, erysipelas, scarlet fever.

Antistaphylococcus Serum, used in the treatment of sepsis caused by Staphylococci.

Antipneumococcus Serum, used in the treatment of pneumonia.

Antigonococcus Serum, valuable in the treatment of gonorrheal joints.

Antidysenteric Serum.

Antimeningococcus Serum; it is injected in 15 to 30 c.c. doses into the spinal canal, after the same amount of fluid has been withdrawn from the canal.

Antityphoid Serum.

Antitoxic Serums

An antitoxic serum is the serum of an animal that has been immunized against the poisonous excretions (toxins) of bacteria, but not against the bodies of the bacteria themselves.

Antitoxic serums are prepared in the same way as antibacterial serums but the animal is repeatedly injected with a filtrate of a bouillon culture of the bacteria obtained through a Berkefeld filter. This filtrate contains only the toxins of the bacteria, but not their bodies.

Preparations

Diphtheria Antitoxin Serum

This is the serum of a horse that has been immunized against the toxin of the diphtheria bacilli. It contains antibodies against the diphtheria toxin. When the serum is injected into a patient suffering from diphtheria, the anti-

SHOCK

bodies combine with the diphtheria toxin, thereby neutralizing the symptoms of the disease.

Diphtheria antitoxin is the most efficient serum which is used at the present time. The disappearance of the membrane in the throat, and the clearing up of all the toxic symptoms result in one to two days after the injection.

It is usually given in doses of 5000 to 10000 units intramuscularly, and in severe cases intravenously (an antitoxic unit is the amount of antitoxin that will immunize a guinea pig weighing 250 gms. against 100 times the fatal dose of diphtheria toxin). It should be repeated every 12 hours until all the symptoms disappear. It should always be given early in the disease. In the later stages the diphtheria toxin may have already combined with the nerve cells and complications may then result, but no case is hopeless.

Diphtheria antitoxin is also given in doses of 500 to 1000 units to those who are exposed to diphtheria cases, to prevent them from contracting the disease (thus immunizing them).

Tetanus Antitoxin

This is the serum of a horse that has been immunized against the toxins of the Tetanus bacilli.

It is given in doses of 3000 to 20000 units every 4 to 8 hours. As an immunizing dose about 1500 units are given.

SHERRY

See ALCOHOL.

SHOCK

Causes of Shock.—*Predisposing Causes.*—Shock is much more apt to develop in the old, weak, or poorly nourished, in patients with a highly impressionable nervous system, and in those exhausted by either mental or physical strain or poisoned by alcohol or other drugs.

Exciting Causes.—Any agent which produces a violent impression on the central nervous system or any agents, such as ether or chloroform, which are highly toxic and cause marked depression may produce shock.

Common Causes.—1. Violent emotions such as grief or fear, both of which cause marked depression of the whole nervous system and therefore of the vital centers. 2. Extreme pain such as may precede or follow an operation or accompany severe burns, crushing injuries or laceration and mangling of the tissues by machinery. 3. Operations or injuries with prolonged exposure of the patient with loss of body heat. 4. Exposure or rough handling of the abdominal viscera in operating. 5. Operations or injuries accompanied by severe hemorrhage or injury to nerve trunks. 6. Extensive

SHOCK

wounds in the skin. 7. Direct pressure over the heart and large blood vessels, and injuries to the larynx.

Symptoms of Shock.—(*Summary*).—Following an operation (or injury) the symptoms to be watched for most closely are apathy, pallor, a pinched, drawn face, cold, moist, clammy skin, extreme weakness, a rapid, weak, irregular pulse, rapid, sighing, irregular respirations and lowered blood pressure.

Treatment of Shock.—*Prophylactic*.—The treatment before an operation is extremely important, quite as important as that following, for it may prevent shock to a large extent. The need of a good night's rest, of comfort, warmth, a cheerful, hopeful frame of mind, a body well nourished and tissues well supplied with water should always be remembered.

Anoci-association in the Prevention of Shock.—The belief that shock is due to afferent impulses either psychic or traumatic in origin has led to the application of anoci-association to prevent operation shock. Anoci-association means the exclusion of all harmful impulses, influences, or associations.

Before the operation, the harmful and depressing effects of anxiety, fear, and dread of pain are prevented by numbing the brain with hypodermic injections of morphine and scopolamine. Sometimes, during the operation—for instance, in exophthalmic goiter—the field of operation is blocked off and all pathways broken by injections of novocaine, so that no harmful impulses reach the central nervous system from the injured tissues. Before closing the wound, quinine and urea hydrochloride are injected around the whole area so that for several days after the operation no impulses reach the brain from the injured tissues.

During an operation the patient is kept well under the anesthetic to prevent harmful impulses reaching the brain. All bleeding, if possible, is completely checked. The operation is performed with speed and the patient returned promptly to a warm bed. In an abdominal operation exposure is avoided, the contents are handled as little and as gently as possible and are protected with hot saline pads.

After the operation the patient should be placed in the recumbent position, kept absolutely quiet and moved about as little as possible in order to relieve the work of the struggling heart. The room should be dark and no visitors, or talking, or noise of any kind, likely to disturb the patient, allowed. Morphine is usually ordered to prevent pain, one of the common factors in the development of shock.

The patient's head should be lowered by raising the foot of the bed or placing him in the Trendelenburg position in

SILVER

order to supply the anemic brain with blood and revive the vital centers. To further increase the blood supply in the heart and brain, the extremities may be bandaged—the arms, from the fingers to the shoulder; the leg, from the toes to the hips.

No tight clothing or weight of bedding should be allowed about the chest as this would further embarrass the breathing.

To prevent heat elimination and to raise the body temperature, heat in the form of extra blankets, hot-water bottles, and friction with a warm towel to the extremities should be applied. Friction with the warm towel stimulates the circulation, removes perspiration and dries the patient. (In treating an accident case for shock, never allow the patient to remain on the cold ground or floor even if warmly covered.) It is said that hot fluids by mouth have little effect, as they remain unabsorbed in the stomach, but that after reaction has set in they are valuable.

To stimulate the heart, a mustard plaster or local heat is sometimes applied over the heart. Care must be taken not to oppress the chest as pressure on the chest will increase the shock.

To increase the volume of blood, to increase the force of the heart and raise the blood-pressure, direct transfusions of blood or repeated intravenous infusions of hot normal saline solution, with or without adrenalin, may be given.

Various *stimulants*—atropine, strychnine, whisky, caffeine, camphor, hot coffee (caffeine), and digitalis—are extensively used, but it is said that recent studies seem to contraindicate their use as they tend to stimulate consciousness or open up pathways for afferent impulses, thus intensifying shock (Hare). They are, however, valuable and are given in cases of extreme shock to ward off immediate death and revive the patient while other treatments are being prepared. When large or repeated doses of stimulants are given it is important to watch later for symptoms of cumulative poisoning.

The *treatments* used to relieve *shock* are much the same as those used to relieve the effects of hemorrhage.

See HEMORRHAGE, and TRANSFUSION.

SIDONAL

See PIPERAZINE.

SILVER (ARGENTUM)

Silver is a white, hard, glistening metal. The only salt of silver which is used to any extent in medicine is the silver nitrate.

Chronic Silver Poisoning ("Argyria")

See ARGYRIA.

SINUS THROMBOSIS

Uses

Silver salts are used to check the growth of granulation tissue and to contract the mucous membranes of the eye, the nose, or the mouth when these are inflamed.

The salts of silver are particularly valuable in the treatment of gonorrheal infection. They destroy the gonococci, the bacteria which cause the disease.

Preparations

Silver Nitrate; dose $\frac{1}{6}$ to $\frac{1}{2}$ of a grain.

This is used in 1 to 2 per cent. solutions dropped in the conjunctiva of the eye, in newly born infants, to prevent gonorrheal ophthalmia. In other gonorrheal infections and for other conditions, it is used in much weaker solutions such as 1:10000 to 1:1000.

Silver nitrate forms an explosive compound with tannic acid.

Moulded Silver Nitrate (Lunar Caustic).

This comes in hard white sticks in the form of pencils. It is used to destroy excessive granulation tissue and other tissues.

Mitigated Silver Nitrate (Mitigated Caustic).

This consists of one part of silver nitrate and two parts of potassium nitrate, fused into pencils like lunar caustic.

Silver Oxide; dose $\frac{1}{2}$ to 2 grains.

SINUS THROMBOSIS

See BRAIN, ABSCESS.

SINUSITIS

See NOSE.

“606”

See SALVARSAN.

SKIN GRAFTS

Skin grafts are of three varieties,—Thiersch, Reverdin, and Wolf.

Thiersch Graft.—The superficial layers of the epithelium are shaved off with a razor and planted over the wound, the grafts being rather large in size.

Reverdin Graft.—In this type small thin portions of the superficial layer of the skin are snipped off with scissors, and placed upon the granulating wound.

Wolf Graft.—In this variety, the entire thickness of the skin is utilized as a graft, or it remains connected by a pedicle to that part of the body from which it was taken, and after the graft is firmly attached the pedicle is severed.

SKIN DISEASES

In all skin grafts, the nurse must not forget to keep the part quiet and warm. In removing dressings, the utmost care should be observed for fear of disturbing the graft itself, and as in all surgical procedures, the best aseptic technique should be maintained.

SKIN DISEASES, NURSING OF

General Directions for Adults

Bathing

Daily baths of soap and water are discontinued in the treatment of many skin diseases, such as *Eczema*. It is usually advisable to give one good cleansing bath before starting treatment. Gibb's super-fatted cold cream soap should be used. After initial bath, daily Corn Starch baths can be given. Starch baths are advised primarily to relieve itching, but patients who are accustomed to daily bathing take great comfort in these baths when soap and water baths are forbidden.

Directions for Starch Bath.—Use sufficient cold water to dissolve $\frac{1}{2}$ box of corn-starch. To this solution add one quart of boiling water. If this solution does not form a jelly, cook on the stove until it does. Pour this mixture into bath tub $\frac{1}{2}$ warm water. Patient should remain in this bath about ten minutes.

Removal of Crusts

The skin must be carefully cleansed of all former treatments before applying new medicaments.

Scales and High Crusts.—Remove gently all superficial crusts with a piece of absorbent cotton soaked in oil.

Heavy Crusts.—Cover the crusts with a layer of vaseline and let this remain on for an hour and then gently lift the crusts with forceps. If this fails to dislodge crusts, apply a hot boric pack. Change the pack every five minutes or until the crusts are softened. After one complete removal of crusts the skin can be kept perfectly clean with the oil and starch baths.

Application of Treatments

Oozing Surface.

A. *Washes:* Shake the bottle or mixture well, pour a small amount of the solution into a saucer and with an old handkerchief sop on the wash, using a patting motion. When thoroughly dry, apply the ointment.

B. *Ointments:* Cover well with ointment a piece of old pillow case about the size of the lesion and apply the dressing

SKIN DISEASES

directly to the oozing surface. Fasten the dressing in place with a thin gauze bandage; never use plasters.

Dry Surfaces.

A. *Washes* applied as for oozing surfaces.

B. *Ointments* applied directly to the lesions with a throat stick, using a sufficient amount to cover the surface.

Crusted Scalps.—Part the hair and with the tip of the finger, rub the ointment into the scalp, about one-half an inch away, make another part and apply ointment in the same manner. Continue applying ointment until the scalp has been completely covered. Tie the hair up in a towel and let it remain over night. In the morning wash the hair with as hot water as patient can stand, using liquid soap. Unless liquid soap is used it is very difficult to remove grease from the hair.

Directions for Making Liquid Soap.—Shave a small cake of soap in very small pieces. Cover well with cold water and let it simmer on the stove until the particles are dissolved. Add one pint of cold water and pour into a large-necked glass bottle. This amount is sufficient for several shampoos.

Care of Infants and Children with Skin Diseases

It is useless to apply treatments to infants or children without coverings, or to expect them to keep from scratching without restraint.

Bathing.—After initial cleansing bath, babies should be given at least one starch bath every morning. In extremely hot weather it is advisable to sponge the baby off with starch water every night.

Application of ointments to the body are the same as in GENERAL DIRECTIONS FOR ADULTS.

Scalp and Face.—All tangled masses of hair and crusts must be removed before applying treatments. It saves a great deal of time if the hair is clipped very close to the head. During the acute stage of a disease, the scalp and face should be bandaged up day and night.

Intertrigo (Scalded Buttocks)

Place a pad under the buttocks and do not put on a diaper until the condition is perfectly healed. Change the pad as soon as baby soils it and apply a fresh layer of ointment. A most satisfactory ointment for the buttocks:

Castor Oil ℥i, *Ointment Zinc Oxide* ℥i. Never use soap or water on the buttocks; clean with oil and when necessary wash off the buttocks with starch water.

To Prevent Scratching: Starch baths at least once a day. General cleansing of skin once a day, and applications of treatments twice a day.

SKIN DISEASES

Continual Use of Cuffs.

Cuffs: Encircle the elbow with a piece of stiff cardboard that reaches from wrist to shoulder (cardboard used for ether cones), bandage on securely and pin to clothing one and one-half inch from the top.

To Prevent Relapses: 1. Careful investigation into feeding.

1. In nursing babies on breast eliminate eggs from mother's diet and cut down on milk and cocoa.
2. Children on diet should not be given eggs in any form. Nurses should not change diet without first consulting the attending physician.
2. Babies and children should be kept in as even a temperature as possible.

Guard against:

- a. Extremely cold weather.
- b. Long exposure to sun.
- c. Sharp winds.

It is always advisable after an attack of eczema to apply a mild cream to the exposed parts before taking the child out doors.

Eczema is not contagious.

Impetigo Contagiosa. (Pus Infection of the Skin.)

Treatment for adults and children alike. Impress upon patient and family that the disease is highly contagious and can be easily spread unless the following rules be enforced.

Precautions.—All articles of clothing, bed linen, toilet articles, etc., belonging to the infected patient should be kept separate. The linen and towels should be boiled every day.

Treatment.—Scrub with soap and water the infected spots twice a day, using a new piece of absorbent cotton for each. Do not touch the good skin when scrubbing the infected spots. Remove all crusts before applying the ointment. Bandage lightly the infected spots. Burn everything that cannot be boiled.

Pediculosis

Pediculosis Capitis (Head Lice and Nits).

Soak the hair well with crude petroleum and then rub into hair (not the scalp) the following ointment:

℞ Acid. Salicylic. ʒss
Sulphuris Praecipitati ʒss
Petrolati ʒi M.

Tie the hair up in a towel, let it remain over night and wash thoroughly with hot water and liquid soap. While the

SKIN DISEASES

hair is wet, comb out the nits with a very fine toothed comb. Petrolatum kills lice, and the Salicylic in the ointment dissolves the shells of the nits. This ointment should be applied every other night until head is clean.

Pediculosis Vestimentorum. (Body Lice.)

Body hairs should be carefully examined for nits. If nits are found, the hair must be either shaved or the ointment for nits be applied directly after a bath. Boil all the clothing that can be boiled, and press with a hot iron everything that cannot be boiled, paying especial attention to the seams of the clothing. One thorough treatment is usually sufficient.

Scabies

All the members of the family who suffer from itching, and all who have slept with a person thus affected, must be treated at the same time if the family wishes to secure definite cure and prevent reinfections.

Treat as follows: A good hot bath, rubbing the body all over with soap and water for fifteen minutes. After the bath rub the ointment thoroughly into the body from chin to toes, back and front, especially between fingers and toes and under the arms. Do not rub ointment on the face or scalp.

For adults repeat this treatment for three successive nights. Children and babies must be given treatments for five nights, because they are given weaker ointments. Babies under three can have ointments on face and scalp.

Have freshly sterilized clothing ready for the patients to put on at the end of the treatment. Gather together all soiled bed clothes and underclothes and boil thoroughly for twenty minutes. Everything that cannot be boiled (as woolen blankets and outside clothing) must be pressed with a hot iron. Patients may complain of itching for several days after this treatment. This may be due to the strong ointments. A starch bath can be given to relieve this itching. If this itching continues for over a week, and there is no sign of dermatitis, treatment should be repeated. It should always be remembered that patients with light hair and fair skin cannot stand as strong ointments as dark haired patients with dark skin.

For Adults:

R Naphtholis 3ss
Sulphuris Sublimati 3i
Balsam. Peruv.
Vaseline 2a 3ss M.

SKULL, FRACTURES OF

The above ointment should be used in half-strength on children under twelve years. For babies under three years:

R Balsam. Peruv.
Vaseline aa 3ss M.

Ring Worm of Scalp and Body

This disease is easily spread from one child to another.

Precautions.—1. The patient should sleep alone.

2. Keep the patient's clothing and towels and toilet articles away from other members of the family.

3. In ring worm of the scalp a close fitting washable cap should be worn at all times. This cap should be changed and boiled daily.

Treatment (Scalp).—Clip the hair close to the scalp. Scrub the infected spots with soap and water twice a day and apply treatment directly to the spots. Pull daily from the infected areas all loose hairs. *Body:* Scrub the spot with soap and water and apply the ointment twice a day. The clothing should be sterilized daily.

Varicose Ulcers

Equipment.—1. Wooden Blocks (5 inches by 8 inches).

2. Bender Bandages.

Old linen.

Ointment.

Safety pins.

Place the two legs of the foot of the bed on the blocks. The dressing must be done twice a day: at night after removing the bandages and in the morning before getting out of bed. Cover with ointment an old piece of pillow-case about the size of the ulcer. Place this over the lesion being careful not to get it over healthy skin. Beginning at toes make two turns and bandage up the leg with a circular motion. Every night on going to bed, remove the bandage and after doing the treatment pin a soft cloth around the leg.

SKULL, FRACTURES OF

Fractures of the skull may be divided into those of the vault and those of the base. Fractures of the vault may be simply fissures in the bone, or the bone may actually be depressed and splintered into several fragments. These cases are often accompanied by injuries to the blood vessels of the *dura* or *pia mater*, or by actual laceration of the brain substance. If it is a simple fracture, the treatment is that of elevating the depressed bone with forceps, or periosteal

SMALLPOX

elevators, and should some of the fragments be splintered very badly they may be removed with rongeurs or punch forceps. Occasionally it may be necessary to trephine.

Fractures of the base are more serious because of the great danger of injuring the important brain structures in this location. As a rule, there is bleeding from the nose, sometimes the ears, and occasionally the pharynx. The treatment consists of absolute rest and quiet. The head should be slightly elevated and fixed between two pillows. If there is bleeding from the nose it is advisable to irrigate the nasal fossæ with warm boric solution to prevent the clot from becoming foul through infection. In cases with bleeding from the ear, it is best to irrigate the external auditory meatus after which the canal should be packed with sterile cotton. The irrigations should be given about three times a day. Of course, the bowel movements should be free. If the patient is unconscious, about two drops of croton oil are placed upon the tongue to insure a thorough cleansing of the alimentary canal. Retention of urine is treated by catheterization. Some surgeons give all these cases urotropin in doses of from ten to twenty grains, three times a day, for it secretes an antiseptic into the cerebrospinal fluid. If these fractures are accompanied by signs of brain injury, and of intracranial pressure from hemorrhage, operative interference is necessary, although the mortality is extremely high.

SMALLPOX (VARIOLA)

Smallpox is an acute infectious febrile disease, characterized by an itching eruption on the skin which passes through five stages, *viz.*, macules, vesicles, pustules, crusts, and cicatrices, the last not always forming but permanent if formed. One attack usually insures immunity thereafter. The five forms of smallpox are:

1. **Varioloid**, which is rarely fatal, and rarely leaves scars. A vaccinated person may have varioloid.

2. Smallpox with **discrete** eruption, in which the pustules remain distinct; this is the most common form of true smallpox.

3. Smallpox with **confluent** eruption, in which the pustules run together; pain and itching are more severe, and sepsis frequently occurs; this form is often fatal.

4. "**Black**" Smallpox, with **hemorrhagic** eruption, *i.e.*, with hemorrhage into the pustules; this form is nearly always fatal.

5. **Malignant** or **Toxic** smallpox, with hemorrhage from all mucous membranes, and with extreme toxic symptoms; this is so rapidly fatal that the rash seldom appears.

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The disease attacks people of all ages and conditions; it is transmissible even from the mother to the unborn infant.

Vaccination was first introduced in England in 1796 by Dr. Edward Jenner, who found in his work as a country practitioner, that persons who had contracted cowpox from cows did not contract smallpox. From this beginning has been developed the modern system of vaccination, compulsory in many countries, and in most of the states of the United States, Massachusetts being the first to make it so in 1809.

The safe and efficient method is by use of vaccine lymph carefully prepared in laboratories from calves. This eliminates any possible transmission of syphilis, tuberculosis, or leprosy, such as occurred with the arm to arm transplanting of virus in the earlier days. The vaccine lymph must be kept according to directions on the label attached in the laboratory; the scab resulting from its use should be not less than half of a square inch in size, except with infants, when the lesion is purposely made smaller.

Immunity gained by vaccination has been said to last from seven to ten years; but it should not be depended on for more than one year. People should be vaccinated whenever exposed; infants should be vaccinated under six months of age. The power of vaccination to modify the severity of smallpox lasts, however, for many years. Before vaccination became generally practised, smallpox was a disease principally of childhood, while now the proportion of adults affected is greater.

Course of the Disease:

The **incubation period** is ten to fourteen days, seldom longer.

The **period of communicability** is from the appearance of the first symptoms to the complete disappearance of scabs and crusts and of discharge from any abscess.

The **symptoms** come on suddenly, often beginning with a chill or convulsion; then follow severe headache, backache, pain in the extremities, nausea, vomiting, and sometimes delirium. Fever of 103° to 104° F. soon appears, and in many cases perspiration, marked thirst and constipation. There is sometimes a prodromal rash, resembling the rash of scarlet fever, on the lower part of the abdomen and the inner sides of the thighs. On the third day the eruption appears, usually beginning on the face near the roots of the hair; this is accompanied by heat and intense itching, and it spreads over the face, trunk, and extremities in a few hours. The initial fever and other symptoms now disappear, but the fever rises again, and delirium sometimes occurs, during the third or pustular stage of the eruption. The fever usually reaches its height about the ninth day, and

SMALLPOX

comes down by lysis. The scabs or crusts have formed and dropped off after three or four weeks.

Complications to be watched for are: abscesses, cellulitis, empyema, myocarditis, nephritis, pharyngitis, pyemia, and septicemia.

Nursing care includes both the curative measures prescribed, and measures for preventing the spread of the disease. *Vaccination* of the patient is sometimes prescribed. The patient should lie in a soft bed in a well ventilated, darkened room. The itching may be much relieved by frequent sponging of the body with tepid water, and by application of oil or vaseline to the crusts. Pus may be cleansed from the pustules by sponging with an antiseptic solution. The patient's wrists should be tied, if necessary, to prevent his scratching himself, as scratching increases the chances of scarring as well as of infection. His hands may be gloved and the gloves kept soaked with antiseptic solution. Special arrangement of light as red or other rays, and application of lint soaked in antiseptic solution or ointment to the face, are often prescribed to prevent pitting. It is important to watch for eruption on the mucous membrane of the mouth, nose, throat, and especially of the eyes; in the latter case serious injury to sight may result. In any case the eyes should be irrigated every two hours with the prescribed antiseptic solution, and the mouth should be frequently cleansed. The fluids and diet taken are, on the whole, as in any febrile disease, details depending on the medical advice in each case. Medication excepting sedatives and cathartics is seldom prescribed.

Prophylactic Measures are as follows: The infective agent of smallpox is not yet isolated, but is known to be present in lesions of the skin and mucous membranes of infected persons. The virus is transmitted by direct contact, by articles soiled with the discharge from lesions; it may be present in all body discharges including throat and nasal secretions as well as urine and feces; and it may be spread by flies. Isolation of the patient in a room screened from flies and free of vermin, and quarantine of exposed persons until they have been vaccinated, or for twenty-one days, should be insisted upon. Concurrent disinfection of all discharges, and of all utensils, bed-clothing, linen, and other articles used in the sick room; and on termination of the period of communicability, thorough cleansing and disinfection of the premises, are of greatest importance. Only the nurse and the doctor should come into direct contact with the patient. They should be vaccinated and should wear rubber gloves and suitable gowns for protec-

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tion, the nurse fastening muslin about her head or wearing a cap to entirely cover the hair.

By observance of preventive measures, as vaccination and prophylaxis during care of patients, smallpox is fast being eliminated. Although the comparatively few cases now occurring are not dreaded as formerly, there are still more deaths than should occur from a preventable disease; and good nursing care is perhaps, excepting vaccination, the most important factor in making it altogether a disease of the past.

See **INFECTIOUS DISEASES, COURSE OF.**

SOAMIN

See **ARSENIC.**

SOAP PLASTER

See **LEAD.**

SODIUM

See **ALKALIES; IODIDES; SALINE DIURETICS; and SALINE PURGATIVES.**

SODIUM NITRITE

See **NITRITES.**

SOLUTIONS

A **solution** is a liquid containing particles of a solid, gas or another liquid, so finely divided, that this dissolved substance cannot be seen, and the resulting fluid seems to be of one color and consistency.

Solute and Solvent

1. The dissolved substance is called the **solute**.
2. The fluid in which a substance is dissolved is called the **solvent**.

The solvent may be any fluid: water, alcohol, ether, etc. The solution is frequently called by the name of the solvent, such as an alcoholic solution, ethereal solution, etc.

The Strength of the Solution

The strength of the solution is the amount of dissolved substance which a given quantity of fluid contains; or the ratio of solute to solvent. It is customary to speak of the strengths of solutions in the following ways:

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1. The percentage method
2. The ratio method
3. The grains to the ounce method

Percentage Method.—In this method we speak of the quantity of dissolved substance (solute), which is contained in 100 parts of fluid (solvent); the solvent is, therefore, always constant. For example, by a 5 per cent. silver nitrate solution we mean that 5.0 gms. of silver nitrate are dissolved in 100 c.c. of water.

Ratio Method.—In this method we speak of the quantity of fluid (solvent), in which one part of the drug (solute) is dissolved. The quantity of solute is therefore always constant (one part). For example, a 1 to 500 solution means that 1 part of solute is contained in 500 parts of water, 1 gm. in 500 c.c. or $\mathfrak{z}\text{i}$ in 500 drams. A 1 to 2,000 solution means that 1 part of solute is dissolved in 2,000 parts of water. A 1 to 30 solution means 1 part of substance is dissolved in 30 parts of water, etc.

Grains to the Ounce Method.—This method is gradually being abandoned and consists of expressing the number of grains of drug dissolved in an ounce of fluid. Like the percentage method the amount of solvent is thus always constant.

Saturation

It is not possible to dissolve *any quantity* of a drug in any fluid. A solution which contains as much of a solid, gas, or another fluid as it can possibly dissolve, is called a **saturated solution**. When more of the same substance is added to such a solution it does not dissolve, but falls to the bottom as a sediment, if it is heavier than the solvent, or rises to the top if it is lighter.

Preparation of a Saturated Solution.—A saturated solution may be prepared by finding the saturation point of the substance required, from the tables on the following pages, and preparing such a solution in the usual manner. The nurse may prepare such a solution, however, by merely adding the desired substance to the fluid until it no longer dissolves but forms a sediment. The fluid is then a saturated solution of the dissolved substance.

Supersaturation

When a saturated solution of any substance is heated, it is able to dissolve more of the same substance. A solution which contains the largest quantity of a substance that it can dissolve when the fluid is heated is called a **supersaturated solution**.

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Table of Saturation Points of Commonly Used Solutions
For Local Use

Name of Solution	Sat. Point in Water	Sat. Point in boiling Water	Sat. Point in Alcohol	Sat. Point in Glycerin
Alum	10%	80%	insoluble	freely when warm
Benzoic Acid	0.4%	6%	30%	.....
Bichloride of Mercury	7%	33%	25%	7%
Boric Acid	5%	25%	7%	20%
Carbolic Acid	8%	All pro- portions	All pro- portions	All pro- portions
Cocaine	0.2%	Decom- posed	17%	.....
Cocaine Hydrochloride .	70%	Decom- posed	40%	.....
Gallic Acid	1%	25%	20%	8%
Lead Acetate ...	30%	50%	3%	.....
Potassium Bicarbonate ...	25%	Decom- posed	insoluble	.....
Potassium Carbonate	50%	70%	insoluble	.....
Potassium Chlorate	6%	40%	slightly soluble	.....
Potassium Permanganate .	6%	25%	Decom- posed	.....
Silver Nitrate ...	65%	90%	4%	.....
Sodium Borate ..	5%	66%	insoluble	50%
Sodium Bicarbonate ¹ ..	8%	Decom- posed	insoluble	.....
Sodium Carbonate	25%	35%	insoluble	.....
Sodium Chloride .	26%	30%	insoluble	.....
Tannic Acid	75%	very soluble	30%	.....
Zinc Sulphate ...	65%	83%	insoluble	.....

¹ It may be noted that sodium bicarbonate is decomposed by boiling, which occurs in solutions of any strength. This should be remembered in preparing sterile sodium bicarbonate solutions for intravenous use. The solution cannot therefore be sterilized after it is prepared. The powder itself may be sterilized by dry heat of a low temperature and dissolved in sterile water when needed.

SOLUTIONS

Table of Saturation Points of Commonly Used Solutions
For Internal Administration

Name of Solution	Sat. Sol. in Water	Sat. Sol. in boiling Water	Sat. Sol. in Alcohol	Sat. Sol. in Glycerin
Ammonium Carbonate	20%	Decomposed	.....	.....
Ammonium Chloride	33%	50%	2%	17%
Ammonium Bromide	45%	53%	7%	.....
Ammonium Iodide	62%	70%	10%	.....
Calcium Oxide ..	0.1%	0.06%	insoluble	.....
Hydriodic Acid ..	10%	All proportions	All proportions	.....
Lithium Bromide.	62%	70%	very soluble	.....
Magnesium Sulphate	54%	88%	insoluble	.....
Methyl Salicylate.	slightly	very	very	.....
Potassium Acetate	71%	More soluble	33%	.....
Potassium Bicarbonate ...	25%	Decomposed	insoluble	.....
Potassium Bitartrate	0.5%	5%	slightly	.....
Potassium Bromide	50%	50%	0.5%	.....
Potassium Citrate	66%	very	slightly	.....
Potassium Iodide.	100%	100%	8%	30%
Potassium and Sodium Tartrate.	45%	50%	insoluble	.....
Quinine Bisulphate	10%	Decomposed	5%	5%
Quinine Hydrochloride .	100%	Decomposed	62%	11%
Quinine Salicylate	1%	Decomposed	8%	6%
Quinine Sulphate.	0.1%	Decomposed	1%	3%
Salicylic Acid ...	0.3%	6%	33%	.....
Sodium Acetate .	50%	All proportions	4%	.....
Sodium Bicarbonate ...	8%	Decomposed	insoluble	.....
Sodium Citrate ..	50%	71%	slightly	.....
Sodium Bromide .	50%	55%	7%	.....
Sodium Iodide ..	100%	100%	25%	.....
Sodium Salicylate	55%	very soluble	15%	.....
Strontium Bromide	50%	70%	soluble	.....
Sodium Sulphate.	26%	Decomposed	insoluble	soluble
Sodium Phosphate	15%	Decomposed	insoluble	.....

SOLUTIONS

Table of Usual Strengths of Commonly Used Solutions
For External Use

Name of Solution	Percentage of Solution	Quantity to Quart
Alcohol	50 to 95%	℥xvi to xxx
Aluminium Acetate (Burrow's Solution) Stock sol.	2 to 7%	℥v to ℥ii
Aluminium Acetate (Burrow's Solution) for local use	1/2 to 2%	℥i to v
Argyrol	5 to 25%	℥i 1/2 to viii
Boric Acid	3%	℥i
Calcium Hydroxide Solution (lime water)	1 1/5%	℥ss
Carbolic Acid	2 to 5%	℥v to ℥i 1/2
Collargol	4%	℥i 1/4
Cocaine Hydrochloride	1/2 to 4%	℥i 1/4
Chlorine Water	0.4%	
Corrosive Sublimate (Bichloride of Mercury) Stock Alcoholic Solution	2%	℥v
Corrosive Sublimate (Bichloride of Mercury) (for use)	0.01 to 0.1%	grs. ii to xv
Creolin	(1-1000 to 1-10000)	
Cresol	1/2 to 2%	℥i 1/4 to v
Eserine Sulphate	5%	℥i 1/2
Eserine Salicylate	1/2 to 1%	℥i 1/4 to ii 1/2
Formalin (Stock) Solution ..	1/2 to 1%	℥i 1/4 to ii 1/2
Formalin (for use)	40% of formaldehyde gas	
Holocain	0.05 to 1/2%	gr. x to ℥i 1/4
Hydrogen Peroxide	1 to 2%	℥ii 1/2 to v
Ichthyol	3%	℥i
Iron Subsulphate (Monsell's Solution)	5 to 50%	℥i 1/2 to xvi
Iron Tersulphate	13%	℥iv
Iodoform	10%	℥iii
Labaracque's Solution (Solution of Chlorinated Soda)	5 to 10%	℥i 1/2 to iii
Lugol's Iodine Solution ...	2 1/2%	℥vi
Lysol	5%	℥i 1/2
Naphthol	1/2 to 3%	℥i to ℥i
Pilocarpine Hydrochloride ..	1 to 50%	℥ii 1/2 to xvi
Potassium Chlorate	1/2 to 2%	℥i 1/4 to v
Potassium Permanganate ...	2 to 5%	℥v to ℥i 1/2
Protargol	1 to 5%	℥ii 1/2 to ℥i 1/2
Resorcin	1/2 to 10%	℥i 1/4 to iii
Sodium Chloride (salt) (Normal Solution)	25%	℥viii
Sodium Chloride (salt) (Physiological Solution)	0.9%	℥ii
Silver Nitrate	0.6%	℥i 1/2
Zinc Chloride	1 to 20%	℥ii 1/2 to vi
Zinc Sulphate	1 to 2%	℥ii 1/2 to v
	1/4%	grs. xxv

SOMNIFACIENTS

**Table of Usual Strengths of Commonly Used Solutions
For Internal Use**

Name of Solution	Percentage of Solution	Quantity to Ounce
Ammonium Bromide	25%	℥ii
Ammonium Iodide	50%	℥iv
Aromatic Spirits of Ammonia	4%	grs. x
Arsenous Acid Solution ...	1%	grs. v
Caffeine Sodium Benzoate ..	25%	℥ii
Camphor Oil	20%	℥i½
Camphor Spirits	10%	gr. l
Campher Water	0.8%	gr. i½
Dilute Acetic Acid	6%	m. xxx
Dilute Hydrochloric Acid ...	10%	m. l
Dilute Hydrocyanic Acid ...	2%	m. x
Dilute Nitric Acid	10%	m. i
Dilute Nitrohydrochloric Acid	20%	℥i½
Dilute Sulphuric Acid	10%	m. l
Diuretin Solution (Theobromine Sodium Salicylate) .	25%	℥ii
Epinephrin Chloride (Adrenalin Chloride)	0.01% (1:1000)	gr. ½
Fowler's Solution of Arsenic (Liquor Potassii Arsenitis)	1%	grs. v
Homatropine Hydrobromide.	2%	grs. x
Mercury Salicylate	0.02% (1:5000)	gr. 1/10
Morphine Sulphate (Magen- die's Solution)	3%	grs. xv
Nitroglycerin solution	1%	grs. v
Paregoric (Tinct. Opii. Camphorata)	0.4%	grs. ii
Potassium Iodide Solution (Saturated)	100%	℥i
Potassium Iodide Solution ..	50%	℥i½
Sodium Bromide	50%	℥iv
Sodium Iodide Solution	50%	℥i½
Spirits of Chloroform	10%	m. l
Spirits of Ether	30%	℥ii½
Spirits of Ether (Compound)	30%	℥ii½
Strontium Bromide	50%	℥iv

SOMNIFACIENTS

See HYPNOTICS.

SOMNOFORM

See ANESTHETICS.

SOPORIFICS

See HYPNOTICS.

SPIGELIA

SPANISH FLY

See CANTHARIDES.

SPARTEINE

Sparteine is a fluid alkaloid which is contained in **sco-parius** or broom tops.

When given internally, its effects appear in half an hour and last for several hours. It is absorbed from the stomach, and it then acts like gelsemium or conium. It weakens muscular contractions by paralyzing the nerve endings in the muscles. It is not as poisonous as either of these drugs, but it affects the heart more.

Action on the heart: **Sparteine** makes the heart beat slower and weaker; by weakening the contractions of the heart muscle, thereby causing a slow, weak pulse.

Sparteine was formerly considered a heart stimulant, but its use for this purpose has been given up, as its action seems to contraindicate such use.

Sparteine does not increase the flow of urine as does **scoparius**, the crude drug from which it is obtained.

Poisonous Effects

The poisonous effects of **sparteine** are the same as those of **conium**.

Preparation

Sparteine Sulphate; dose $\frac{1}{15}$ to 2 grains.

See **SCOPARIUS**, and **CONIUM**.

SPICAS

See **FRACTURES**.

SPIGELIA (PINKROOT)

Spigelia or pinkroot is the root of the *Spigelia marilandica*, or Carolina pink, a plant growing in the southern United States.

Spigelia is used to remove round worms. As it does not destroy the worm, it must be followed by a brisk cathartic.

Poisonous Effects

Overdoses of **spigelia** have occasionally produced the following symptoms, especially in children:

1. Dry, flushed skin.
2. Puffiness and swelling of the face.

SPINAL CORD, SURGERY OF

3. Rapid pulse, delirium and stupor.
4. Dimness of vision or temporary blindness.

Preparation

Fluidextract of Spigelia; dose 1 to 2 drams.

For a child, 10 minims is given on a piece of sugar, often together with senna.

See ANTHELMINTICS.

SPINAL CORD, SURGERY OF

The surgery of the spinal cord is really limited to one operation (*laminectomy*). Its object is to expose the spinal cord for examination in those cases suffering from cord pressure due either to a tumor mass or bone fragments of some vertebral fracture. The procedure consists in an incision over the desired vertebræ, retracting the muscles attached to the vertebral column, exposing the laminæ and spines of the vertebræ, which are then removed with rongeurs, laminectomy forceps, saws, and chisels, exposing the dura of the spinal cord. This is then carefully incised and an exploration of the cord is made. The dura is then sutured and the muscles drawn over it. A moulded cast is applied over the back well into the trunk, and the wound permitted to heal.

SPINAL DOUCHE

See DOUCHES.

SPIRITS

Spirits are preparations of volatile substances dissolved in alcohol.

SPLINTS

See FRACTURES.

SPRAINS

A **sprain** is an injury to a joint caused by a sudden, violent movement—a wrench, a twist or a strain which, if continued, would result in a fracture or dislocation.

The result is bruising of the synovial membrane, which causes very severe and sometimes sickening pain because of its abundant nerve supply; a rupture or severe stretching of the ligaments, tendons and muscles which support the

SPRAINS

joint; and a rupture of blood vessels with bleeding into the tissues and often into the synovial sac.

This injury to the tissues is followed by an inflammatory reaction which gives rise to an inflammatory exudate in the ligaments, tendons, muscles, subcutaneous tissue, and sometimes into the synovial sac.

Sprains of the wrist and ankle are the most common because these joints are more exposed to injury, but sprains of the elbow and knee and other superficial joints also occur.

Symptoms.—There is first very severe pain, sometimes so severe as to cause fainting or nausea and vomiting. The joint swells quickly, is extremely tender to the touch, and soon becomes discolored if the surface blood vessels have been injured. Discoloration from rupture of the deeper vessels may not appear for a day or two. When the inflammatory reaction begins there is heat and increased swelling, tenderness and pain on motion.

Treatment.—A sprain is often very wrongly considered a slight injury—"just a sprain"—when in reality it may be a very serious injury. A fracture may be very easily and is frequently mistaken for a sprain. Even a surgeon is sometimes unable to determine the diagnosis without the aid of the X-Ray and sometimes a general anesthetic. Even a sprain, if neglected or carelessly treated, may result in a permanently weak joint or in a partial or complete stiffness with continued pain. It is dangerous to attempt to "walk off" a sprain of the ankle unless it is very slight or has been properly treated and supported by a surgeon.

The treatment depends upon the severity of the case and also varies with different surgeons. Efforts are first made to relieve the pain, to arrest the hemorrhage and serous effusion and to aid its absorption. Sometimes cold applications in the form of ice-compresses, aluminium acetate, or aluminium and opium solution are used with the part elevated and kept at rest. Sometimes the part is immersed in hot water, the temperature being gradually increased until it is as hot as the patient can stand. This relieves the pain, contracts the blood vessels and lessens the hemorrhage and effusion. The part is then tightly bandaged to prevent further congestion. Sometimes the part is strapped firmly enough to give support and relieve the strain without preventing movement and the patient is encouraged to use the part freely. This helps to maintain a free circulation and to prevent stiffness. For severe sprains well-padded splints or molded plaster-of-Paris casts may be used. For a sprained wrist the arm may be supported and elevated by a sling. To increase the circulation about and in the joint

SQUILL

local applications of heat (baking, electric light, high frequency current, hot water), massage, and passive movements are used.

SQUILL (SCILLA)

Squill is obtained from the bulb of the *Urginea maritima*, the sea onion, a plant growing in the southern part of Europe. The outer coat of the bulb is removed, and the bulb is then cut into slices. From these slices the preparations are made.

Squill acts like digitalis but it is not as reliable. It is more rapidly absorbed, however, and after absorption it especially increases the secretions of all mucous membranes. It is therefore frequently used to loosen and increase the cough, especially in old people. In such patients the mild improvement of the heart action and the increased secretion of the kidneys benefit the general health as well.

Preparations

Syrup of Squill; dose 30 to 60 minims.

Compound Syrup of Squill; dose 10 to 30 minims.

This contains squill, senega and tartar emetic.

Guy's or Fothergill's Pill

This contains calomel, squill, digitalis (powdered leaves); one grain of each. It is an excellent diuretic.

Squill is usually given in pill form for diuretic action. As an expectorant the syrup is usually given. It is also contained in Stokes' expectorant.

STAINS, TO REMOVE

Removal of Stains from Linen.—Stains may be *organic* as in the animal stains from meat, blood, eggs, milk, fat, perspiration; or vegetable and fruit stains from oils, mildew, and various fruits and vegetables. They may be *inorganic* as from ink, paint, medicines, mineral acids, or alkalies.

The agents used to remove them may be:

(1) Solvents.—Water (cold or boiling): Acids such as oxalic acid crystals (1 per cent.): Alkalies such as ammonia. Volatile liquids such as alcohol, ether, or chloroform.

(2) Absorbents such as starch, blotting paper, fuller's earth, or magnesia.

(3) Chemicals such as soap solution, gasoline or benzine.

(4) Bleaches such as Javelle water, borax, sunshine, peroxide of hydrogen, or dilute ammonia.

General Rules for the Removal of Stains.—(1) Remove

STAINS

stains as soon as possible to prevent fixation in the fiber. (2) Try the simplest methods first. (3) Cold or tepid water or milk will not fix a stain—hot water will fix some stains, while soaking in cold water will often aid in removal. (4) Soap sets a stain, therefore always remove a stain before the article is washed. (5) When using boiling water, stretch the stained part over a bowl and pour absolutely boiling water with force (kettle held high) through the stain until it disappears. (6) When using an acid, stretch the stained part over a bowl of boiling water, apply the acid with a medicine dropper or old toothbrush, dipping the stain occasionally into the water and again applying the acid. When the stain disappears rinse thoroughly in clear water, then in tepid water containing a little ammonia which will neutralize any acid remaining and prevent any injurious effect. (7) When bleaching by the sunlight, wet the cloth or stain and lay it upon the grass in the direct sunshine. Sunlight bleaches by oxidation in the presence of moisture. Keep the stain moist and leave it on the grass as the process is slow. (8) Peroxide of hydrogen and dilute ammonia also bleach by oxidation and are particularly useful for woollens. Use equal parts of fresh peroxide of hydrogen and dilute ammonia (one teaspoonful of ammonia to one pint of water) and moisten the stain until it disappears. (9) When bleaching with Javelle water (which consists of 1 lb. sal soda, $\frac{1}{4}$ lb. chloride of lime, 2 qts. cold water), stretch the article and rub the Javelle water into it; then rinse thoroughly and quickly in clear water and finally in water containing a little ammonia. (10) Volatile liquids such as gasoline, benzene, chloroform or alcohol, etc., should be used in daylight, if possible in the open air, and never near a lamp or fire, as the fumes are very inflammable. Do not put any of these agents on a wet cloth as it weakens the action of the liquid and also may leave a stain. (11) Always rinse out acids or bleaches thoroughly. (12) Repeated short applications of chemicals, washing after each in clear water, are less harmful to fabrics than one long application.

Removal of Specific Stains.—Blood.—When *fresh* or recently dried, soak in cold or tepid water with or without ammonia; then rub out; when the stain is brown and nearly gone wash out with soap and warm water. If very dry apply peroxide of hydrogen; soak and wash out. When the *stain is old*, keep it wet with peroxide of hydrogen and ammonia for several hours if necessary. For thick blood and blood on bed ticking, apply a thick paste of starch and water and allow to stand in the sun; when the paste is dry and discolored, remove it and apply a fresh paste.

STAINS

Ink.—The method depends upon the character of the ink. The following agents and methods may be used:

(1) When very fresh it may sometimes be washed out in clear water. (2) Soak the stained portion in either sweet or sour milk for several days if necessary; rinse thoroughly and try again if necessary. (3) Apply dilute hydrochloric acid or oxalic acid (one-quarter teaspoonful to a cup of water); rinse thoroughly. (4) Moisten with salt and lemon juice and lay in the sun. (5) Apply salts of lemon (in powder form); then pour on boiling water. (6) Apply peroxide of hydrogen and dilute ammonia. (7) Apply a few drops of hydrochloric acid or oxalic acid; follow by Javelle water, then boiling water quickly. (8) *Red ink* may be removed with cold water or water and ammonia or with Javelle water. (9) For *indelible ink*, if the base is silver nitrate, apply a 10 per cent. solution of potassium cyanide; if the base is an anilin dye, it cannot be removed.

Chocolate or Cocoa.—Wash in cold water (first covering with borax helps); rinse and then pour boiling water through it. If unsuccessful use a bleaching agent.

Coffee.—Pour on boiling water from a height. If unsuccessful use a bleaching agent.

Tea.—Rub out in cold water; then pour on boiling water. Glycerin may be used first to soak the stain.

Fruit.—Apply warm alcohol to soften and dissolve the stain; then pour on boiling water from a height; or rub with salt before applying the boiling water. If unsuccessful use oxalic acid or a bleaching agent.

Milk or Cream.—Wash out with cold water; then soap and tepid water.

Vaselin, grease, oils cannot be removed if washed in water. Soak vaselin stains in kerosene before washing—the kerosene evaporates; or wash with turpentine; oil may be absorbed by using blotting paper or powdered chalk. Gasoline may be used for materials that cannot be washed; chloroform or carbona may be used; they are better and there is no danger from flame or explosion. Always rub toward the center; use by daylight and in a draft and have several folds of clean cloth under the stain.

Medicines may usually be removed with alcohol.

Iodine.—Apply ammonia or chloroform and wash in warm soapy water.

Argyrol.—Soak in 5 per cent. potassium cyanide.

Silver Nitrate.—Apply 10 per cent. solution of potassium cyanide, apply bichloride of mercury, then wash.

Picric Acid.—Soak for one minute in a solution of potassium sulphate; then wash with soap and water or apply a paste of magnesium carbonate for an hour or so.

STIGMATA

Mucus.—Wash in ammonia and water before using soap, or in salt and water.

Perspiration.—Use a strong soap solution and let the article lie in the sun. For perspiration under the arm use dilute hydrochloric acid.

Rust.—Lemon juice, salt and sunlight may dissolve it, or dilute hydrochloric acid, oxalic acid and dilute hydrochloric acid may be used.

Acids.—Sponge with water and a few drops of ammonia.

Balsam of Peru.—Soak in kerosene or alcohol.

Urine.—Wash with warm water and soap; sponge with alcohol.

Mildew.—If fresh, it may be removed, but when old, it cannot be removed. Moisten with a strong soap solution; apply a paste of soap or salt and chalk and leave in the strong sunlight for several hours; if unsuccessful use Javelle water or other bleaching agent.

STATUS EPILEPTICUS

See EPILEPSY.

STEAROPTENE

See OILS.

STEGOMYIA

See MOSQUITOES.

STEREOTYPY

Stereotypy is the performance of the same acts in the same way over and over, walking in a limited space, striking the chest, shaking the body, rubbing and pulling the hair, etc.

STERILIZATION

See DISINFECTION.

STERULES

Sterules are glass capsules containing a sterile solution of a drug. They are used for hypodermic administration.

STIGMATA

See MENTAL DEFICIENCY.

STIMULANTS

TABLE OF CIRCULATORY STIMULANTS

Drugs acting rapidly. Suitable for immediate effect	Drugs acting slowly. Suitable for continuous effect	Drugs causing a rapid pulse	Drugs causing a slow pulse	Drugs whose effects wear off quickly	Drugs which raise the blood pressure
Caffeine Strychnine Atropine Camphor Epinephrin Pituitary Extract Ammonium Alcohol Digalen Digipuratum (ampoules) Musk	Digitalis Strophantus Squill Convallaria Apocynum Adonis Vernalis	Caffeine Atropine Ammonium Alcohol Camphor (sometimes) Musk	Digitalis Strychnine Epinephrin Pituitary Extract Camphor (sometimes) Strophantus Squill Convallaria Apocynum Adonis Vernalis	Caffeine Epinephrin Ammonium Alcohol Musk	Epinephrin Pituitary Extract Ergotoxin

STOMACH, NURSING IN DISEASES OF

STINGS

See BITES AND STINGS.

STOMACH, NURSING IN DISEASES OF

In nursing diseases of the stomach the most important feature of the nurse's work is to consider the main function of the stomach, namely—digestion; and ascertain by the observation of symptoms the degree of incapacity that exists in the performance of this function; and to know if the loss of function is of organic or mechanical nature. *Dietotherapy* is the treatment of disease by prescribed foods and is most frequently used in treating stomach diseases.

In Children

In infancy we rarely find the stomach involved alone, being associated with the intestines in nearly all diseases. At birth, the capacity of the stomach is approximately 1½ ounces and the rate of growth about 1 ounce for each month. The position is almost vertical so that regurgitation is accomplished with ease. To overcome a tendency to regurgitate, babies should have the head elevated after feeding.

Vomiting is a condition arising from a great number of sources, and is of various types, viz.: habit vomiting, projectile vomiting, stercoraceous vomiting, etc.

Hematemesis is the term applied to vomiting of blood. It is important to note the type and duration of vomiting and the character of vomitus.

The most common *malformation of the stomach* is stenosis of pyloric or cardiac orifice.—*Pylorospasm* is a spasmodic affection of pylorus and tends to develop an overgrowth of circular muscle fibers at this point with a resultant obstruction. Dietotherapy is the usual treatment. Feedings are at four hour intervals of five to eight minutes duration. Sometimes a definite quantity of food is prescribed in which case breast-fed babies are not permitted to nurse but the desired quantity of milk is pumped out and fed to the baby.

Lavage empties the stomach of food and allays the spasm.

Acute gastric indigestion is a term applied to a series of symptoms caused by the inability of stomach to digest food. There is usually vomiting, dulness or excitement, sometimes convulsions, rise of temperature 100°-102° F. and diarrhea. The stools contain undigested food. The nurse should note the symptoms carefully and apply heat over the epigastrium to control the pain. When feedings are prescribed they must be given absolutely according to instructions.

In Adults

Acute Gastritis:—This is usually due to indiscretions in eating and drinking and is one of the most prevalent com-

STOMACH, NURSING IN DISEASES OF

plaints we have to deal with. The symptoms are headache, lassitude, feeling of fulness in the epigastrium, sometimes nausea and vomiting with frequent eructations of gas.

The best remedy is to relieve the stomach of the mass of food which is probably partially decomposed and fermenting; this can be accomplished by the use of mild emetics such as a large quantity of luke-warm water with a pinch of salt or baking soda—3 to 4 cupfuls. After emptying the stomach a dose of castor oil is usually given to remove any undigested food which may have passed on into the intestines.

Chronic Gastritis and Nervous Dyspepsia are so similar in symptoms that it is sometimes difficult to differentiate the disorders. The treatment is dietotherapy, as the causes are in most cases errors in diet. The ingestion of large amounts of fats or carbohydrates, fried foods, excessive use of tea or coffee with meals, and too great haste without giving much thought to proper chewing and mastication are the main causes. The *treatment* is to remove the cause—small amounts of food of easily digestible type, sometimes a milk diet for a week or two may bring much comfort to the patient. In these cases usually, a test meal is given and a fluoroscopic examination is made to determine the position and motor activity of the stomach. After these procedures, a proper diet is prescribed and the nurse's duties are usually very arduous in keeping the hungry patient from deviating from this diet.

In these cases hydrochloric acid (dilute) may be given as it is usually lacking, and the normal ferments—pepsin and rennin—require an acid medium for their action.

Dilatation of the Stomach: Dilatation may be *acute* (due to some acute fever, such as typhoid or pneumonia), or *chronic* (due to some obstruction at the pylorus, combined with a weak muscle wall).

The usual *treatment* of these disorders is a small amount of easily digestible food at three to four hour intervals. Lavage between meals helps to restore tone and usually makes the patient comfortable.

Gastroptosis is a condition of weakened muscular tone of the walls and ligaments which hold the stomach in position permitting the stomach to descend below the normal level in the abdomen. Lying on the back with the hips and legs elevated for three to four hours daily, together with a firm abdominal binder helps to overcome this condition.

Ulcer of the Stomach: By ulcer of the stomach we mean a necrosis of a circumscribed area in the mucus membrane

STOMACH, NURSING IN DISEASES OF

which may penetrate through the muscle and peritoneum in which case it is termed a perforated ulcer of stomach. Superficial ulcers are quite common; they may heal over rapidly and do no harm.

Ulcers may occur singly or in numbers and appear most frequently near the pylorus. The patient may have gastric ulcer and be entirely unaware of it; but, usually, the symptoms of chronic gastritis are present. The grave conditions accompanying ulcer are perforation and hemorrhage.

Hematemesis in adults is very nearly always symptomatic of ulcer. Put the patient to bed in a quiet room, place an ice-bag over the epigastrium, give absolutely nothing by mouth, and call a surgeon. Early treatment or operation may save the patient's life. Delays are extremely dangerous. The after-care of a gastro-enterostomy is a part of the training in surgical nursing and requires rigid adherence to the surgeon's orders. Absolute quiet both for mind and body, with the performance of such care as the surgeon prescribes usually brings about a good recovery.

Cancer of Stomach: The symptoms of cancer of the stomach are loss of weight and strength with a progressive anemia, combined with marked symptoms of dyspepsia. The vomitus usually contains evidence of slight hemorrhage. If the patient does not vomit, traces of blood may be found in the stools. The treatment is surgical in the early stages; and in the advanced stages usually the administration of drugs to keep the patient comfortable.

Neurosis of the Stomach: The real source of many gastric disturbances is not in the stomach itself but in the nervous system. The nervous control of the stomach being much disturbed, the stomach symptoms are only a part of the picture of neurasthenia presented. In these cases, the general treatment is rest, psychotherapy and forced feeding; because usually the patient objects to so many types of food that if left to his own choice, he will usually select an unsuitable diet.

Hyperacidity and *subacidity* are terms used to indicate the amount of acidity above or below normal of the gastric juice secreted; and the condition is usually treated after correction of diet by the administration of alkalies or acids as the case indicates.

In nursing diseases of the stomach it is very important that the nurse should have a knowledge of food values and the proper preparation of foods to successfully care for these cases.

Very few medicines are given, but lavage and dietotherapy are constantly employed.

STOMACH, SURGICAL CONDITIONS OF

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Gastric Dilatation (Post-operative)

One of the most distressing complications which may arise after an operation, and one which, if not treated radically, energetically, and thoroughly may result in death, is acute gastric dilatation. As the name implies, in this condition the stomach becomes enormously dilated, and presses upward on the diaphragm. This makes respiration very difficult because of the constant pressure on the diaphragm. And, inasmuch as the pyloric orifice of the stomach is atonic, the intestinal contents seep back into the stomach, resulting in persistent vomiting of large amounts of greenish and brownish colored fluids. To relieve this condition those means must be employed which will cause the dilated stomach to contract and approach its normal size.

Treatment.—The stomach should be lavaged with a hot soda bicarbonate solution at 110 to 112 degrees Fahrenheit, and the lavage continued until the return is absolutely clear. While this treatment is under way, turpentine stupes should be applied to the upper abdomen for ten or fifteen minutes. It is important to bear in mind that as these stupes must be hot to be efficacious, the abdomen should be thoroughly greased with vaseline before applying them, as great care must be taken that the skin is not burned. The integrity of the skin must be preserved because this procedure is to be repeated every two or three hours, according to the discretion of the attending surgeon. The stupe probably is the most efficient and reliable method for applying external heat, although some authorities advise the use of huge flax-seed poultices. Strychnine sulphate, gr. 1/60, may be given by hypodermic injection every four hours, following the principle that the strychnine will improve muscle tone.

The patient, of course, during this period, should be given nothing by mouth, but measures should be taken to supply the system with water; this may be administered by means of a Murphy drip, or eight ounces of tap water be given by rectum every four hours. If the patients show signs of shock, which they often do, a hypodermoclysis of 500 to 800 c.c. of saline should be given, or, in some instances, an infusion of saline. If nourishment be an essential element, a solution (two to five per cent.) of glucose may be administered intravenously.

After the initial period of vomiting has come to an end, it is advisable to give the stomach an absolute rest for about twenty-four hours, and then to start the patient on what may be called a "gastric tolerance diet." The theory of this diet is to partially desensitize the mucosa of

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the stomach and make it more tolerant to fluids by the use of small doses of chloroform water. If this is retained, peptonized milk is then gradually increased, the chloroform water is omitted, and the patient, after a period of absolute gastric tolerance, is gradually brought over to a selected soft diet.

Gastrostomy

When the esophagus is narrowed either by a benign structure, or carcinomatous tissue to such an extent that feeding is practically impossible, a gastrostomy must be performed to prevent the patient from starving. This is an operation whereby a communication is established between the anterior surface of the stomach and the anterior abdominal wall. Through this gastric fistula, fluid may be introduced, the patient, in this fashion, being given nourishment without the food actually entering the esophagus. There are different types of operations done but they all are essentially the same: they vary in their technique.

Ante-operative Treatment.—The abdomen is prepared in the usual manner. Inasmuch as these patients are very emaciated and weak, the operation is performed under local anesthesia, preliminary to which morphine gr. $\frac{1}{4}$ with atropine gr. $\frac{1}{150}$ is given hyperdermatically.

After Treatment.—The patient is fed every four hours through the catheter. A convenient way of doing this is to connect it with a small funnel so that the fluids may be easily poured into the stomach. The foods which may be given are limited to those which can be made up into or dissolved in fluids, and from six to ten ounces of liquids may be given at a feeding. Their caloric value should always be estimated and great care should be taken to see that the patient is given sufficient food. Some surgeons permit their patients to chew solid food for the taste and because a flow of gastric juice is stimulated by the hormone "secretin" of the saliva; but, naturally the patients are not permitted to swallow the food.

After the first few days the catheter should be removed and changed daily, a fresh clean one always being ready for immediate insertion. After the feeding the end of the tube should be clamped so as to prevent leakage, and an abdominal binder applied. In about two months' time the tube may be left out of the stomach, and inserted at the feeding periods only. The fistula in the interim may be covered with a piece of vaselinated gauze, held in place by a binder. Patients should be taught to insert their own tubes, the method of feeding themselves, and the foods which may be taken.

It is highly important that the skin about a gastric fistula

STOMACH, SURGICAL CONDITIONS OF

be kept scrupulously clean. Should gastric contents leak either from or around the tube, the skin should be washed immediately and covered with some bland non-irritating ointment, such as Beck's paste or vaseline. If this is not done, the gastric juice will digest the skin and a painful ulcerated area about the tube may result.

Gastro-Enterostomy

Ante-operative Treatment.—In chronic cases of ulcer of the stomach prior to the time of operation, fluid should be forced upon the patient so that there will be a reserve amount in the tissues. An hour before operation the stomach is washed. Great care should be taken that the return flow is absolutely clear at the completion of the treatment and that none of the lavaging fluid is left within the viscus.

After Treatment.—There is some degree of shock following this type of operation, and it is necessary to administer saline hypodermatically, or by rectum by Murphy drip. The drip should be kept on for about four hours and off for two. This will prevent irritability of the rectal mucosa, and insure the proper absorption of the fluid. But as soon as the patient is receiving sufficient nourishment by mouth the drip may be discontinued.

When the patient has recovered from the anesthesia, he should be placed in Fowler's position for this position favors the passage of the ingested food through the new opening, the gastro-enterostomy stoma. Some surgeons are in the habit of allowing fluids within a few hours after the anesthetic nausea and vomiting have disappeared. Water is given in dram doses every hour, and if it is tolerated, after a few feedings an ounce of peptonized milk is allowed every two hours, alternating with water every two hours. This may be followed on about the second or third day by an ordinary Lenhartz diet.

Complications after Gastro-enterostomy.—*Hemorrhage.* Occasionally, after the operation, the pulse may mount in frequency and the patient exhibit all the clinical symptoms of hemorrhage. This is evidence of gastric bleeding. The patient should immediately be placed in an upright position in bed, and cold applied over the upper epigastrium by ice bags, ice coils or cold compresses. Cold may be applied internally by permitting the patient to swallow small pieces of cracked ice, adrenalin hydrochloride, 1:1000 may be given in saline solution by mouth to control the bleeding for its local action as a vasoconstrictor is well known, and, at times, it is a very efficient hemostatic.

Vomiting.—In spite of the fact that an operation has been

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performed upon the stomach itself, the surgeon will order a gastric lavage eighteen to twenty-four hours after operation if the vomiting is persistent; this may be repeated as often as is necessary.

Gastric Ulcer

Gastric ulcer starts as an erosion of the mucosa of the stomach, the ulceration gradually extending deeper, at times, eating its way through the muscular and serous coats of the stomach causing a communication between the interior of the stomach and the general peritoneal cavity. The ulcer in itself is not so serious but by growing it may open a blood vessel, causing a gastric hemorrhage (hematemesis). Or the scar tissue which follows in the path of a healing ulcer may interfere with the gastric functions by creating various deformities of the stomach. This is especially true when the ulcer occurs in the region of the pylorus; subsequent healing of an ulcer in this location may result in a narrowing or stenosis of the pyloric orifice. The third danger already mentioned is that of perforation, through which the gastric contents are emptied into the general peritoneal cavity resulting in a peritonitis.

The *symptoms* of gastric ulcer, in brief, are epigastric pain, vomiting, and bleeding. Although the latter is one of the most persistent signs of gastric ulcer it may be absent. Examination of the stomach contents may show an increase in the amount of free hydrochloric acid and the presence of blood. X-ray examination with a bismuth meal may reveal an irregularity in the outline of the stomach, indicative of ulcer.

Treatment of Gastric Ulcer.—The treatment is both medical and surgical. The latter only will be discussed here. Surgical treatment is employed when (1) medical treatment has given little relief, (2) when perforation of the ulcer has occurred, (3) when perforation has resulted in the formation of an abscess, or (4) when the pylorus has become stenosed.

The treatment of the chronic cases is to short circuit the food contents from the stomach to the jejunum directly, instead of first passing through the pylorus and duodenum. This will permit the ulcer to heal by giving the pyloric portion of the stomach a functional rest; and, in those cases of pyloric constriction, the food will now have a free exit through the new opening. The establishment of a new opening in the stomach and attachment to it of the intestine is known as gastro-enterostomy. The jejunum may be attached to either the anterior or posterior surface of the stomach resulting in either an anterior or posterior gastro-jejunosomy.

STOMACH TUBE

Perforated Gastric Ulcer

Ante-Operative Treatment.—Patients suffering from a perforation of a gastric ulcer have, as a rule, a beginning peritonitis, and as they are more or less in a condition of shock, it is advisable that before operation $\frac{1}{4}$ of a grain of morphine be given hypodermically. This will relieve to a degree some of the intense cramp-like pains and will make the inductive stage of anesthesia smoother so that the struggling is less. If they are in a state of severe shock, a preliminary infusion of about 550 c.c. of saline should be given.

Post-operative Treatment.—As soon as possible the patient is placed in the Fowler position, and if greatly shocked a clysis is given, of 500 to 750 c.c. of saline. Some prefer the administration of saline by rectum, given by Murphy drip, four hours on and two hours off. Feeding is begun after eight to twenty-four hours, and the patient may be placed upon a Lenhartz diet. As a matter of fact, treatment for this condition is almost the same as that for a gastro-enterostomy.

Cancer of Stomach

The symptoms of which the patient will complain are determined by the area in which the growth is located. If it is near the cardiac end where it does not interfere with the functions of the stomach there may be no symptoms at all. If it is in the fundus of the stomach there may be pain, vomiting, loss of weight and anemia. If it is in the pyloric portion, these symptoms are duplicated and there is a greater tendency to vomit because of the obstruction. Examination of the stomach contents in these cases may reveal a low acid content, no free hydrochloric acid and often the presence of lactic acid. X-ray examination is sometimes a valuable aid to diagnosis, and occasionally, the tumor mass may be felt in the upper abdomen in the position of the stomach.

Surgical Treatment of Cancer of Stomach.—The only hope in cases of gastric cancer is partial or complete excision of the stomach (gastrectomy). The operation is rather shocking and the mortality is high. The technique for operation and the post-operative care are practically the same as that already described in the treatment of gastric ulcer.

STOMACH TUBE

See LAVAGE.

STOUT

See ALCOHOL.

STRAPPING

STOVAINE

Stovaine is an artificial alkaloid which is used principally as a local anesthetic and for spinal anesthesia. Its effects are similar to those of cocaine with the following differences:

1. It dilates the blood vessels.
2. It is less poisonous than cocaine.

In the eye it is used in a 4 per cent. solution. On other mucous membranes, in a 5 to 10 per cent. solution. Hypodermically, it is used in a $\frac{1}{2}$ to 1 per cent. solution.

Preparation

Stovaine (in tablets) each containing $\frac{1}{30}$ of a grain.

See COCAINE.

STRAMONIUM (THORNAPPLE, JAMESTOWN WEED)

Stramonium is obtained from the leaves of the **Datura stramonium**, a weed growing in England and the United States. Its active principles consist mostly of **hyoscyne** but it also contains **atropine** and **hyoscyamine**.

Appearance of the Patient

Stramonium is usually given to patients suffering from attack of spasmodic asthma.

When a preparation of stramonium is given, or the fumes of burnt stramonium leaves inhaled, the patient is relieved of the asthmatic attack. The breathing is easier, the pulse is strong and rapid. The patient complains of dryness of the mouth and throat and is very thirsty. The pupils are dilated, and the patient is somewhat more active and more talkative.

Administration

Stramonium is given in the form of cigarettes, which are smoked during an attack of asthma, or the leaves are burned in a saucer and the smoke inhaled. It relieves the attack by relaxing the spasm of the involuntary muscles of the bronchi.

Preparations

Stramonium leaves made up into cigarettes, or the plain dried leaves are the most commonly used preparations.

Extract of Stramonium; dose $\frac{1}{4}$ to $\frac{1}{2}$ of a grain.

Fluidextract of Stramonium; dose 1 to 2 minims.

Tincture of Stramonium; dose 5 to 15 minims.

Stramonium Ointment.

This contains 10 per cent. of the extract of stramonium. It is used principally for painful hemorrhoids.

STRAPPING

See FRACTURES

STROPHANTHUS

STROPHANTHUS

Strophanthus is a drug obtained from the ripe seeds of the **Strophanthus hispidus**, a climbing shrub of Africa. Its active principle is a glucoside, **strophanthin**.

Action

Strophanthus acts like **digitalis** but its effects vary in the following instances:

1. When given by mouth it may not be absorbed; therefore its effects are unreliable.

2. It increases the contraction of heart muscle more than **digitalis** does.

3. It is much more poisonous than **digitalis**; the poisonous effects appear more suddenly and are more severe.

4. It frequently causes profuse diarrhea.

5. It is more rapidly eliminated than **digitalis**.

Its active principles, however, are very useful for intravenous use.

Preparation

Tincture of Strophanthus, dose 5 to 15 minims.

See **DIGITALIS**.

STRYCHNINE

See **NUX VOMICA**.

STUPES

See **FOMENTATIONS**.

STUPOR

Stupor is a profound disorder of consciousness in which ordinary impressions are not comprehended and voluntary activity is suspended. The impression may be received normally but because some inhibitory process interferes with the usual mechanism no reaction takes place. The patient is aroused from this condition only by the strongest stimuli. The pulse is slow and small, the temperature is subnormal, the skin is dry, the extremities cold, the mouth is filled and overflowing with saliva, the eyes may be open but the mind does not perceive, and no voluntary movements are made.

ST. VITUS' DANCE

This trouble is confined almost altogether to children with a highly nervous temperament, and to overcome it a great deal of patience and careful watching are required. Plenty of sleep is an absolute necessity, and when the nerves are too excited to allow of natural sleep, hypnotics must be resorted to. A quiet, easy life should be followed, with simple amusements and plenty of outdoor exercise, light but bounti-

SUBNORMAL TEMPERATURES

ful diet, without meats or stimulating foods, and a free action of the bowels daily. A shower bath or brisk sponge bath every morning, commencing with lukewarm water, and gradually making it colder, and gymnastic exercises to strengthen the muscles, are very beneficial.

STYPTICS

See HEMORRHAGE.

STYPTIC COLLODION

See TANNIC ACID.

STYPTICINE (COTARNINE HYDROCHLORIDE)

Cotarnine hydrochloride, or **stypticine**, is an artificial alkaloid, made by oxidizing narcotine, one of the alkaloids of opium.

It contracts the blood vessels, and the uterus.

It is principally used to check bleeding from the uterus. It is also used to check bleeding from other parts of the body, such as the lungs, the stomach, or the intestines, by contracting the blood vessels of these organs. Gauze soaked in cotarnine is very frequently used by dentists to check bleeding.

Preparations

Cotarnine Hydrochloride (Stypticine); dose $\frac{1}{4}$ to 2 grains.

It is given hypodermically in solution, or by the mouth in pills or tablets.

Cotarnine Phthalate (Styptol).

Hypodermically 3 grains dissolved in 30 minims of water.

By mouth, 3 to 5 tablets a day. Each tablet contains $\frac{3}{4}$ of a grain of the drug.

STYPTOL

See STYPTICINE.

SUBNORMAL TEMPERATURES

Temperatures Below Normal.—The body must maintain a certain degree of heat in order to carry on the chemical changes in the tissues upon which the maintenance of life depends. Life can be maintained for a short time only at a temperature of 95° F. or below. **Subnormal temperatures may be due to** (1) excessive heat elimination, as from profuse sweating, night sweats, a severe hemorrhage, or loss of other body fluids; (2) lessened heat production, as in starvation and lowered vitality. In starvation the patient lives on his own tissues, the muscles and other tissues being used to supply the heat and energy necessary to carry on

SUGAR, TESTS FOR

the vital functions of the heart and respirations, etc. These are spared until the last. (3) Extreme depression of the nervous system as in shock or collapse. All the nerve centers which control and stimulate the functions of the body are depressed and inactive so that the functions of every organ, including the heart and lungs, will be weakened and may be entirely suspended.

See SHOCK.

SUGAR, TESTS FOR

See DIABETES MELLITUS.

SUGAR OF MILK

Sugar of Milk (*Saccharum Lactis*) is used as a flavoring substance and to give consistency to powders.

SUGGESTIBILITY

Suggestibility is a condition in which the activity is determined by impressions or suggestions received from others. There are three types: **Echolalia**, the tendency to repeat the exact words of another; **echopraxia**, the tendency to repeat or imitate the movements of another; and **catalepsy**, the tendency to hold or maintain by muscular rigidity a given position. If the arms are extended over the head, they will be held in that position for a very long time, it may be all day, unless some one changes them. Some patients who show this tendency can be molded or fashioned into almost any attitude and the positions are maintained indefinitely (*Cerea flexibilitas*). There is believed to be a form of muscular anesthesia present and the position of the various parts of the body is apparently unknown and unfelt.

SULPHONAL

Sulphonal is a white powder without any odor or taste. It does not dissolve readily in water. Within 1 to 6 hours after giving a dose of sulphonal, the patient falls asleep. The sleep is not very deep, but it lasts for about 8 to 10 hours, and sometimes longer. The pulse and breathing are usually not affected. On awakening, the patient often feels drowsy, complains of fullness in the head, and headache; and his gait may be a little unsteady. Occasionally, sulphonal is so slowly absorbed that it produces sleep the day following the night of its administration.

Action

Sulphonal resembles chloral in its effects, which appear more slowly, however. It produces no local effects.

After absorption, it lessens the activity of the brain, pro-

SULPHUR

ducing sleep; and in large doses, sulphonal often makes the breathing slow and shallow. It does not affect the heart action.

Idiosyncrasies.—In some individuals, instead of sleep, the following symptoms are produced:

1. Nausea and vomiting.
2. Excitement.
3. Dizziness.
4. Staggering.

Poisonous Effects

Acute Sulphonal Poisoning.—An overdose of sulphonal is rarely, if ever, fatal. It occasionally causes: Stupor, and slow, shallow breathing.

Cumulative Sulphonal Poisoning.—Since sulphonal is more slowly excreted than it is absorbed, its prolonged use often causes the following alarming symptoms, which may even result in death:

1. Pink color of the urine.
2. Abdominal pain.
3. Nausea and vomiting.
4. Constipation.
5. Weakness and unsteady gait.
6. Mental confusion and hallucinations.
7. Paralysis of various groups of muscles of the arms or legs.
8. Suppressed urine; the urine often containing albumin.
9. Collapse, which may result in death.

Treatment.—1. Stop the drug.

2. Saline diuretics are usually given.
3. Move the bowels thoroughly.
4. The collapse is usually treated with heart stimulants.

Administration

Sulphonal is best given in large quantities of milk or hot water several hours before bedtime. Dose 15 to 30 grains.

SULPHUR

Sulphur is an element which occurs in the form of a yellow powder. It is found in volcanoes and also as compounds of various metals.

Local action: Applied to the skin it slightly checks the growth of bacteria and destroys parasites (parasiticide). It stains silver objects black, by forming silver sulphide.

Internal Action: When taken internally, the sulphides which it forms in the intestines increase the secretions; producing mild movements of the bowels. It is eliminated from the body as sulphides by the expired air; to which it gives a very foul odor, and also by the stools.

SULPHUR DIOXIDE

Poisonous Effects: Continued use of sulphur often causes anemia, great wasting and tremors of the muscles.

Preparations

Washed Sulphur; dose 15 to 60 grains.

Precipitated Sulphur; dose 1 to 4 drams.

Sublimed Sulphur, or Flowers of Sulphur; dose 1 to 4 drams.

Sulphur is best given in a small quantity of syrup.

Sulphur Ointment.

This contains 15 per cent. of sublimed sulphur with benzoin and lard.

Liver of Sulphur (Potassa Sulphurata).

This is a preparation of sulphur which is often used in ointments and baths in doses of 1 to 6 drams of sulphur to a gallon of water. This substance is very destructive to tissues (corrosive).

SULPHUR DIOXIDE

Sulphur dioxide or sulphurous acid is a gas which is formed when sulphur is burned. It is an excellent disinfectant for rooms; but it is apt to injure clothing, linens, carpets, etc.

Uses: Sulphur dioxide is formed when sulphur candles or sulphur masses are burnt in the room. The sulphur should be placed in a metal or porcelain dish placed in a basin of water, and the sulphur should then be burned. All cracks and key-holes in the room should be tightly closed.

SULPHURIC ACID (OIL OF VITRIOL)

Sulphuric acid acts like the other acids, except that it checks intestinal secretions and the sweat.

It is rarely used except as a remedy for lead poisoning and occasionally to check diarrhea and night sweats. The concentrated acid is occasionally used to destroy an infected area of the skin (caustic action).

Preparations

Dilute Sulphuric Acid; dose 10 to 30 minims.

This contains 10 per cent. of sulphuric acid.

Aromatic Sulphuric Acid; dose 5 to 15 minims.

This contains 20 per cent. of sulphuric acid in alcohol, flavored with ginger and cinnamon.

For Local Use: Sulphuric Acid (Oil of Vitriol.

This contains 92 per cent. of sulphuric acid.

See ACIDS, INORGANIC.

SUMACH

See RHUS GLABRA.

SUPPOSITORIES

SUMBUL

Sumbul or vegetable musk is obtained from the root and underground stems of the **Ferula sumbul**, a plant which is very little known. Its active principle is a volatile oil.

It is used principally to allay nervousness and make the patient calm and quiet. It may be given in large doses.

Preparations

Extract of Sumbul; dosé 4 grains.

Fluidextract of Sumbul; dose 30 minims.

SUNSTROKE

Sunstroke or **insolation** results from exposure, especially of the head and neck, to the direct rays of the sun.

The sun's rays have a powerful effect on the body, elevating the body temperature and acting as a powerful excitant to the brain and all nerve centers. Marked congestion and swelling of the face, scalp, meninges, and brain occur.

The **symptoms** are violent headache, mental excitement which may become maniacal, convulsions, and loss of consciousness. The attack may prove fatal or, if the patient recovers there may be permanent impairment of the mind with loss of memory or power to concentrate, together with other nervous disturbances, and inability to stand exposure to heat.

The **treatment** is that of heatstroke.

See **HEATSTROKE**.

SUPPOSITORIES

Suppositories are cone-shaped preparations of a drug made up with cocoa-butter.

Rectal suppositories may consist of concentrated food, soap, glycerin or plain or medicated cocoa-butter. They are prepared in the shape of a cone. They retain this shape at a normal or room temperature but when introduced into the rectum are dissolved by the heat of the body. Drugs contained in them are then set free.

Varieties of Suppositories Used.—1. *Evacuant.*—Soap and glycerin suppositories are used to cause the expulsion of feces. They are particularly valuable when the feces are in the lower bowel or rectum, but cannot be expelled because the tight or sensitive anal sphincter will not relax. The irritation caused by the presence of the suppository stimulates the rectum to expel it. Glycerin suppositories for adult use are larger than those used for infants and young children. Long, thin suppositories are used for infants. Soap suppositories may be purchased ready for use, but may easily be made by taking a splinter of white soap and holding

SUPPOSITORIES

it in hot water until smooth and rounded to the required length and shape. It should be cone-shaped and may be from one to three inches long.

2. *Astringent suppositories* consisting of tannic acid, belladonna, and glycerin are used in dysentery and diarrhea to contract the tissues, check bleeding, relieve pain and dry up the secretions. Bismuth suppositories are used in the same conditions. The bismuth forms a coating on the mucous lining and prevents irritation. In this way it checks diarrhea caused by the irritating contents in the intestines.

3. *Ice suppositories* are sometimes used to check local bleeding or to relieve local inflammation. An ice suppository may be made in the same way as the soap suppository. It must be of a suitable shape and size, round and smooth and free from all sharp edges.

4. *Anodyne or local sedative suppositories* are used for hemorrhoids, dysentery, diarrhea, rectal abscesses or in post-operative conditions in which it is necessary to limit peristalsis and keep the rectum at rest. The drugs commonly used are cocaine, opium and belladonna added to cocoa-butter. Cocaine relieves pain and by contracting the blood vessels relieves bleeding if present. Opium and belladonna relieve pain, check peristalsis and dry up secretions.

5. Suppositories containing opium or veronal acetate are given for a *general sedative effect* when for any reason it is inadvisable to give the medication by mouth.

6. *Specific Suppositories*.—In malaria large doses of quinine given as a specific frequently cause severe gastric disturbances on account of the irritating effect of the quinine on the lining of the stomach. To prevent this quinine may be given in the form of a suppository.

Method of Procedure.—A suppository should be well lubricated with a small amount of petrolatum or other lubricant before insertion. It should be carried to the bedside in a gauze wipe or a small piece of gauze. When inserting the suppository a nurse wears a glove and inserts the suppository as far as the finger will reach. Pressure is then applied over the rectum for a short time until all desire to expel the suppository has passed. A patient should never be permitted to insert a suppository.

Suppositories should always be kept in a cool place to keep them from melting. It is necessary to keep glycerin suppositories on ice.

Vaginal and Urethral suppositories are also used.

Vaginal suppositories are used as a means of applying local remedies to the cervix or walls of the vagina. A vaginal suppository is inserted in the same manner as a rectal suppository. The patient should lie flat on her back

SYNCOPE

with her knees flexed. Vaginal suppositories are larger than rectal suppositories.

Urethral suppositories are much smaller and are shaped like a fine pencil. They are well-lubricated and gently inserted and pushed forward until the entire length has been introduced.

SUPPRESSION OF URINE

See URINE, SUPPRESSION OF.

SYNCOPE

Syncope is a condition of more or less complete unconsciousness due to anemia of the brain resulting from a sudden fall of blood-pressure or failure of the heart to maintain the circulation.

The *causes* of the cerebral anemia may be:

1. Lowered blood-pressure from the actual loss of blood as in a hemorrhage.

2. Lowered blood-pressure from a weakened heart action which fails to maintain the circulation and allows the blood to accumulate in the veins.

The weakened heart action may be the result of heart disease or of some temporary weakness resulting from depression of the nervous system as from the action of drugs, or fear, or worry, etc., or from physical exhaustion as from hunger, overexertion, or slight exertion when in a weakened condition.

3. The lowered blood-pressure and weakened heart action may be due to stimulation of the vasomotor center resulting in a marked change in the distribution of blood in the three great reservoirs of the body—the skin, intestines, and muscles. In fainting, the skin is blanched and the body surface is cold because the blood vessels of the skin (and of the intestine) are contracted and the blood is driven into the dilated vessels of the muscles. This explains fainting as the result of severe pain, fright, joy, the sight of blood, or of an accident, all of which directly or reflexly stimulate the vasomotor center.

The *Symptoms*.—A feeling of weakness and dizziness with roaring in the ears may precede the attack or the patient may suddenly feel weak and fall, unconscious, to the ground. The face and lips are blanched, the eyes are closed, the body surface is cold and clammy, the muscles are completely relaxed, the pulse is weak and small, and the respirations are shallow.

The *Treatment*.—In most cases merely lowering the head between the knees or placing the patient flat on his back with the head low, will prevent an attack or revive a

SYPHILIS

patient. Fresh air should be admitted freely to the patient and all clothing should be loosened about the neck, chest, and waist. The respirations may be stimulated reflexly by giving inhalations of smelling salts or ammonia, by sponging or dashing cold water over the face and chest, or by friction to the chest with the hand moistened in cold water, or by slapping the chest smartly with the hands or end of a cold wet towel. Heat applied for a brief period over the heart will increase the force and rate of the heart beat and stimulate the circulation. Heat applied to the neck, head and face will increase the supply of blood in the head and excite the mental activities.

When consciousness is regained and the patient is able to swallow, water, aromatic spirits of ammonia, whiskey, or a hot drink should be given.

After an attack of syncope, the patient should not attempt to sit up or walk about, but should lie quiet and at rest until the circulation is re-established.

SYPHILIS

See IODIDES; MERCURY; and VENEREAL DISEASES.

SYRUPS

Syrups are preparations of drugs made with sugar and water.

T

TABES DORSALIS

Tabes dorsalis, commonly called **locomotor ataxia**, is a syphilitic disease of the spinal cord, in which there is a chronic inflammation of the membranes and degeneration of the posterior roots and columns, the fibers of which convey sensation and impressions of muscle sense. Many physical symptoms are produced and mental symptoms also may occur.

Among the earliest **symptoms** are sharp, darting pains, "lightning-like pains," which start in the ankle and instep and shoot up the leg to the thigh; then gradually the ataxia begins, inability to walk in the dark, or to move the legs unless each movement is watched and directed by sight. The patient may be able to stand erect, but upon closing the eyes while so standing, will sway and fall, because equilibrium can no longer be controlled through the muscle sense. This is known as *Romberg's sign*, and is an important symptom of this condition. There may be gastric pains and disturbances and sudden attacks of vomiting. Urinary and bladder disturbances may also be present. The pupils do not react to light and there are other reflex changes. Mentally the patient may be disordered, have hallucinations and delusions, be depressed and gradually deteriorate.

Nursing procedures. This is a disease of slow progress and prolonged course, and remissions may occur which always bring great hope to the patient and the family. For a long time the patient may be able to get about with the help of a cane and later with crutches, but gradually he becomes unable to stand and finally is helpless and must be cared for in bed. The usual measures of care and observation must be given as the symptoms make them evident.

TABLETS

Tablets are dried powdered drugs which have been compressed into small discs. They are usually prepared in an

TÆNIACIDES

aseptic manner so that they can be given hypodermically. Tablets are very easily dissolved.

TÆNIACIDES

Tæniacides are drugs which destroy or remove tape worms.

Tape worms are long flat worms which consist of many segments. They often inhabit the intestine as a result of eating meat or pork infected with their eggs.

See ANTHELMINTICS.

TAKA DIASTASE

This is a starch digesting ferment formed by the action of a mold upon wheat bran. It is named after its discoverer, Takamine, a Japanese.

Taka diastase is very powerful and efficient, but it only acts in the stomach before the normal amount of acid is secreted. The action of starch digesting ferments is usually destroyed by the acid in the stomach.

TALCUM

This is magnesium silicate and is used as a bland soothing dusting powder.

TANNIC ACID OR TANNIN

Tannic acid is an organic acid which is found in a great many vegetable substances. It is obtained from powdered nutgall or oak gall. Tannic acid is very closely related to gallic acid, which is tannic acid combined with water.

Local action: **Applied to the skin,** to a wounded surface or to an ulcer, tannic acid contracts the tissues by coagulating or hardening their cells. If applied to a bleeding point, it stops the bleeding.

Internal Action: **In the mouth:** It has a harsh bitter taste, and makes the mouth feel dry by contracting the mucous membrane.

In the stomach: It precipitates the protein of the food which is then not readily digested.

In the intestines: It contracts the mucous membrane, thereby checking its secretions and making it less susceptible to impulses that start peristalsis, which is then lessened, and the bowels are constipated.

Poisonous Effects

Tannic acid is not a strong poison. Large doses often cause nausea, vomiting and diarrhea.

Uses

1. To check excessive secretion of the alimentary tract, as in diarrhea.

TAR

2. To check excessive secretion and swelling of mucous membranes, as in the diseased condition of the mouth in mercury poisoning.
3. To prevent bed sores by hardening the skin.
4. As an antidote to various metallic and alkaloid poisons.
5. It is often given as an astringent irrigation in the colon and vagina.

Administration

For a local effect it should be given in the form of an ointment or a lotion.

For its effect in the stomach, it is best given in powder form.

For its effect in the intestines, it is best given in pill form.

Preparations

Tannic Acid; dose 2 to 10 grains.

Troches of Tannic Acid; dose 1 grain.

For Local Use: Glycerite of Tannic Acid.

This contains 20 per cent. of tannic acid.

Tannic Acid Ointment.

This contains 20 per cent. of tannic acid.

Styptic Collodion.

This contains 20 per cent. of tannic acid.

TANNIN

See TANNIC ACID.

TANNINS

Tannins are substances whose chemical composition has not yet been determined, but they seem to be acids. They are found in the bark of many trees, in witch hazel and other plants. They form insoluble precipitates with alkaloids and proteins, and are therefore used principally as astringents.

TAPE WORMS

See TÆNIACIDES.

TAR (PIX LIQUIDA)

Tar is a black, semi-solid, sticky substance of a peculiar characteristic odor and taste. It is an oleoresin, obtained from the wood of various species of the pine tree.

When tar is distilled, it forms the oil of tar, an oily liquid, and a solid black residue called pitch.

Tar consists of a number of substances; the following are the most important ones: cresote, pyroligneous acid, wood alcohol, and a number of other compounds.

Local action: Tar is used principally as an antiseptic and irritant in skin diseases. It usually causes considerable in-

TARTAR, CREAM OF

flammation. When the skin becomes severely inflamed, the fact should be reported to the physician. Tar should be applied with great care to the face and parts of the body where the skin is tender.

Internally, it is principally used as a stimulating expectorant, especially in chronic bronchitis. It is occasionally used to destroy intestinal worms, and as an intestinal antiseptic.

Preparations

Oil of Tar; dose 1 to 5 minims.

Syrup of Tar; dose 1 to 3 drams.

This contains $7\frac{1}{2}$ per cent. of tar.

Tar Ointment.

This contains 50 per cent. of tar.

TARTAR, CREAM OF

See SALINE PURGATIVES.

TARTAR EMETIC

See EMETICS.

TARTARIC ACID

Tartaric acid is the acid of grape juice. Its action is similar to that of acetic acid.

It is principally used to increase the flow of urine, in which it is excreted as alkaline carbonates.

It is also used as a laxative, and it is an ingredient of the seidlitz powder.

Tartaric acid is usually given in the form of grape juice, as a cooling refreshing drink. As a diuretic or laxative, its various salts such as potassium tartrate, etc., are preferred.

TEA

See CAFFEINE.

TEETH, CARE OF

See MOUTH AND TEETH, CARE OF.

TERPIN HYDRATE

Terpin hydrate is a colorless crystalline substance made from the oil of turpentine, by the action of nitric acid, alcohol and water.

Terpin hydrate is used principally as an expectorant, as an antiseptic in gonorrhea, and in inflammation of the bladder. Dose 1 to 3 grains.

TESTICLE

This is the male organ of generation and corresponds to the ovary. It consists of the testis proper which manu-

TESTICLE

factures the spermatozoa, and the epididymis which is really a series of canals collecting the sperm from the glandular substance of the testes. These tubules, or canals, unite to form a single duct, the vas deferens, which carries the testicular product to the seminal vesicles, small pouches situated behind the prostate which open into the floor of the prostatic urethra together with the openings of the prostate gland. The prostate gland lies in front of the bladder surrounding the prostatic urethra and secretes the fluid which nourishes the spermatozoa and gives the seminal fluid its characteristic qualities.

While the great majority of these cases will be handled by orderlies and trained attendants, circumstances may arise which will necessitate that they be cared for by skilled nurses.

Acute Inflammation of Testicle (and Epididymis)

Probably the most common cause of the acute inflammation is gonorrhea affecting the epididymis mainly, although it may be secondary to certain chronic diseases such as gout, or trauma from urethral instrumentation.

Symptoms.—There is pain, swelling, tenderness of the epididymis, and systemic symptoms of anorexia, fever, and general malaise.

Treatment.—The patient is ordered to bed, and the testicle is elevated by placing beneath the scrotum broad strips of adhesive plaster which are fastened to the shaven thighs. Local applications to the scrotum may be made in the form of heat or cold. Probably the application bearing heat which is lightest in weight is the flaxseed poultice. If ice is used it should not be left on continuously, but on for two hours and off for one. An enema should be given daily, and the patient forced to drink water in large amounts. When the condition is due to gonorrhea, the patient should be placed upon individual precaution. After the acute symptoms have subsided, the patient may be allowed up, but the scrotum should be firmly supported by a suspensory for some time.

Chronic Inflammation of Testicle (and Epididymis)

These are secondary to acute inflammations, or due to syphilis or tuberculosis. If syphilitic in nature the patient is given anti-syphilitic treatment in the form of mercury and salvarsan. If tuberculous, the best procedure is operative.

Symptoms.—The pain is not so severe as in acute inflammations. In the cases of tuberculosis, there may be a sinus in the scrotum discharging pus from the diseased epididymis.

Treatment of Tuberculosis.—Tuberculous epididymitis,

TEMPERATURE

when only one side is involved, is treated by orchidectomy (excision of the affected testicle). These cases require no special nursing care except that they should be placed upon individual precautions and kept out in the open air as much as possible.

Hydrocele

Lying in front of the testis and epididymis there is a small sac called the tunica vaginalis. This may become filled with fluid causing a hydrocele of the tunica vaginalis. As a rule it is not painful but uncomfortable because of its mere mechanical presence.

Palliative Treatment.—In this procedure a needle or a trocar and cannula are inserted into the hydrocele sac and the fluid withdrawn. After most of the water has been tapped, some surgeons reinject an irritating fluid, such as a mild solution of carbolic and iodine, trusting that the irritation will cause the obliteration of the sac of the tunica vaginalis.

Operative Treatment.—The operative procedure may be done under novocaine. The scrotum is washed with green soap, alcohol and ether. The skin of the scrotum is anesthetized. The distended tunica is delivered into the wound, incised, part of it cut away, and the remainder sutured behind the testicle proper, destroying the sac.

Post-operative Treatment.—The scrotum is supported upon a bridge and a moderate amount of pressure is applied to it to prevent post-operative bleeding.

Varicocele

Lying in the scrotum along with the spermatic cord is a plexus of veins. These very often become hypertrophied or increased in size and number, occasionally causing pain and a dragging sensation in the scrotum. This may be remedied by partially excising the veins through the scrotum, or just above the external abdominal ring. The only post-operative care is the support of the testicles by an adhesive bridge, and the wearing of a suspensory bandage subsequently.

New Growths of Testicle

The testicle, like the ovary, may be a location for cysts, spermatocele, dermoids, or carcinoma. In the cases of cancer, a radical excision of the testicle together with the vas deferens and the lymph glands draining these regions is performed, but the operation is attended with very much shock, and the mortality is extremely high.

TEMPERATURE

The body temperature may be ascertained by placing the thermometer in the mouth, the axilla, groin, rectum, or

TEMPERATURE

vagina. The temperature sought is that of the interior of the body uninfluenced by contact with clothing, air, or moisture, etc., so the thermometer must be placed where it can be completely surrounded by body tissues and where there are large blood-vessels and a free circulation of blood near the surface. The nearer these conditions are approached, the more accurate the temperature taken will be.

Departure from the Normal Temperature.—Slight variations from 98.6° F. are not usually considered abnormal—variations within the limits of from 97° to 99° are usually not significant. Apart from the deviations indicated above, compatible with health, any departure from the normal temperature indicates that there is something wrong in the body. The elevation of temperature, however, is not always an index of the seriousness of the disease, for it may be higher in the shorter, less serious or fatal infections than in the most fatal. For instance, the temperature in tonsillitis is frequently higher than in diphtheria, and in some fatal infections there may be no elevation at all. A prolonged high temperature is always very serious. Recovery seldom occurs at a temperature above 107° F.

The following classification is commonly used to describe the various degrees of temperature:

Hyperpyrexia	105° F. and over
High fever	103° to 105° F.
Moderate fever	101° to 103° F.
Low fever	100° to 101° F.
Subfebrile	99° to 100° F.
Normal	98.6° F.
Subnormal	97° to 98.6° F.
Collapse	95° to 97° F.
Algid collapse	below 95° F.

The extremes of these temperatures, if maintained, are fatal to life. Even a slight elevation of temperature—99° to 99.6° F.—occurring persistently every afternoon or evening, may be, and frequently is an early symptom of such a serious disease as tuberculosis.

In taking the temperature by mouth, place the end of the thermometer containing the mercury under the tongue, because here it will be close to large arteries. See that the lips are kept tightly closed and that the patient breathes through the nose only. The mouth should be thoroughly clean. Leave the thermometer in this position until the mercury reaches a constant height, but do not leave it longer than necessary. The time will depend upon the thermometer used and varies from two to five minutes. The

TEMPERATURE

best grade of thermometer will register in one-half minute, but as the mouth contains air derived from the exterior, the lips must remain tightly closed for at least two minutes to allow it to warm up to the body temperature. The normal temperature of the mouth is 98.6° F.

The Axillary Temperature.—The temperature is sometimes taken by axilla when it cannot be taken by mouth because it is convenient, hygienic and occasions little discomfort or exertion to the patient. Before placing the thermometer in position see that the axilla is free from moisture or perspiration, but do not rub the part because the friction may increase the temperature and make it inaccurate. See that the bulb is placed securely in the axilla and that it is completely enclosed by the body tissues by placing the arm over the chest with the fingers on the opposite shoulder. Do not allow the clothing to come in contact with the thermometer. It must remain in position ten minutes.

For infants, the **groin temperature** is sometimes taken. The thigh must be well flexed over the abdomen. Ten minutes are required for registration.

The axillary and groin temperatures are usually about one-half degree lower than that of the mouth.

The rectal temperature is the most reliable and is generally used for very ill or toxic patients, for infants, children, restless and delirious patients. This method cannot be used after rectal operations, or when the rectum is diseased, inflamed or not perfectly clean. Oil the bulb before inserting it to prevent irritation—irritation is not only a discomfort, but it draws an increased supply of blood and therefore heat in the part. It also stimulates the muscles of the rectum to expel the thermometer. Insert the bulb about two inches. The rectal temperature is usually from one-half to one degree higher than that by mouth.

Never leave children or restless, delirious or hysterical patients alone with a thermometer, for their restless movements are apt to displace or break it. Hysterical patients, and sometimes others, also, occasionally try to mislead the nurse into thinking that their temperature is elevated by “sucking” the thermometer or holding it on a hot-water bag or in hot fluids, etc.

The Care of Thermometers.—Thermometers, whether used for mouth or rectal temperatures, should be rendered scrupulously clean and free from infection after use by washing thoroughly in cold water and allowing them to stand in an antiseptic solution (usually bichloride of mercury 1 to 2,000) long enough to disinfect them.

All thermometers should be tested and compared at regular intervals with a standard thermometer, because the glass

THEOBROMINE

gradually contracts so that, after a time, the readings are inaccurate, being slightly too high.

TETANUS ANTITOXIN

See SERUMS.

TETANY

See THYROID GLAND, DISEASES OF.

TETRONAL

Tetronal is a white powder. Its effects are similar to those of trional and sulphonal. It is given in the same way, but it is not often used because it is more poisonous. Dose 15 to 30 grains.

See SULPHONAL.

THEOBROMINE

Theobromine is a white powder, an alkaloid, obtained from the seeds of the **Theobroma cacao**, the chocolate tree of South America. It is very closely related, chemically, to caffeine. Its action is similar to that of caffeine.

Internal Action.—**In the mouth:** It has a somewhat bitter taste.

In the stomach and intestines: It increases the secretions and peristalsis; often causing nausea, vomiting and frequent movements of the bowels.

Action on the heart: It makes the heart beat stronger and faster. It also contracts the blood vessels. The pulse is therefore stronger and faster.

Action on the muscles: Theobromine increases the contractions of all the muscles.

Action on the kidneys: Theobromine and its salts are excellent diuretics. They increase the flow of urine, by directly increasing the activity of the kidney cells. In this way, they remove fluid from the tissues and from the abdomen, relieving the edema of the extremities and ascites.

Excretion

Theobromine and its salts are rapidly eliminated from the body mainly by the kidneys; usually in a few hours.

Poisonous Effects

Since theobromine is rapidly excreted, it very rarely produces poisonous effects. When poisonous symptoms do occur, they are the same as those produced by caffeine.

Administration

Since theobromine and its salts are rapidly eliminated, they are best given in small doses, frequently repeated (about every two hours), when a continuous effect is desired.

THERMO-CAUTERY

Preparations

Theobromine; dose 5 to 15 grains.

This preparation is apt to upset the stomach.

Theobromine Sodium Salicylate (Diuretin); dose 5 to 15 grains.

This preparation is very frequently given as a diuretic, because it is more readily dissolved than the others.

See **CAFFEINE**.

THERMO-CAUTERY

The application of the Paquelin thermo-cautery, as a rube-facient, consists in an application of dry heat made by passing the red-hot platinum tip of the cautery to and fro over the affected part until it becomes well reddened. Sometimes the skin is lightly flicked with the red-hot tip. The Paquelin cautery consists of a hollow, platinum tip which is screwed on to a hollow metal rod or cylinder, and a handle which in turn is connected by rubber tubing to one arm of a metal container. To another arm of this container a rubber tubing and a soft rubber bulb covered with netting are attached. In the metal container there is a small sponge which is saturated with benzine before using the cautery. By squeezing the rubber bulb the fumes of benzine may be forced along into the platinum tip. When the tip is heated in a flame it may be kept constantly at the required temperature by simply squeezing the rubber bulb gently so as to keep the tip supplied with benzine fumes. The metal container is provided with a valve by means of which the escape of the fumes may be prevented when the apparatus is not in use.

The **cautery is used** for the relief of inflammation and pain in sciatica and other painful nerve trunks, in lumbago, torticollis and other forms of muscular rheumatism.

The Method of Procedure.—The treatment is usually given by a doctor. The nurse's duties are to prepare the patient and the apparatus and to keep the platinum tip supplied with benzine fumes and at the right temperature.

To prepare the patient place him in the most suitable and comfortable position. Arrange the bedclothes neatly so as to avoid unnecessary exposure. An extra blanket may be necessary to protect and keep the patient warm. Reassure the patient that there is no danger of burning or pain, but instruct him to keep still. Usually it is best not to allow the patient to see the red-hot tip except when, as sometimes happens, the treatment is given for its possible psychic effect.

Before taking the apparatus to the bedside it should be examined to see that it is intact and in good working order. When the treatment is being given the platinum tip

THORACIC ASPIRATION

should be kept red-hot, not white-hot. Avoid forcing too much air into the air bulb or reservoir, so as to prevent it bursting. As a rule the heated platinum tip is not allowed to touch the patient. As a precautionary measure, in case of restlessness, some doctors prefer to have a layer of gauze over the part. Sometimes, however, the skin is touched lightly along the path of the nerve, etc., with the heated tip. Avoid touching anything with the heated tip, not only because it will burn whatever it touches, but because when heated it is soft and easily dented. Never cool the tip by putting it in water. When the treatment is completed, rearrange the bedclothes and make the patient comfortable. Before putting the apparatus away see that the valve is closed so as to prevent the evaporation and loss of any benzine which may remain.

THERMOMETRY

There are two scales used in thermometry, the Fahrenheit and the Centigrade. The former is generally used. However, since many of the scientific calculations are made using the Centigrade scale it is wise for the nurse to understand how to translate one to the other.

Centigrade has 0° as the freezing point and 100° as the boiling point, while Fahrenheit has 32° as freezing point and 212° as boiling point. To change Fahrenheit to Centigrade it is necessary to subtract 32 from 212 in order to make the freezing points correspond. This would read $212 - 32 = 180^{\circ}$ F. $= 100^{\circ}$ C.; hence a degree Centigrade represents $5/9$ of a degree Fahrenheit.

To change Centigrade to Fahrenheit it is necessary to remember that every Fahrenheit degree is $9/5$ times as large as the Centigrade and the addition of 32° must also be made. For example: Change 105° F. to Centigrade: $(105^{\circ} - 32^{\circ}) \times 5/9 = 41^{\circ}$ C. Change 50° C. to Fahrenheit: $(50^{\circ} \times 9/5) + 32^{\circ} = 90^{\circ} + 32^{\circ} = 122^{\circ}$ F.

See TEMPERATURE.

THORACIC OR CHEST ASPIRATION

A chest or thoracic aspiration is the withdrawal of fluid from the pleural cavity.

The treatment is indicated when resolution or absorption of fluid fails to take place and when its accumulation causes pain, dyspnea and other symptoms of pressure. Frequently removal of part of the fluid is sufficient to enable the body to complete its absorption.

Dangers involved in a Chest Aspiration.—(1) Shock; (2) puncture of the intercostal or pulmonary blood vessels with a severe hemorrhage which may prove fatal; (3) puncture

THORACIC ASPIRATION

of the lung or of the diaphragm; (4) fatal syncope due to the withdrawal of fluid and the sudden relief of pressure on the heart, blood vessels and lungs, etc.; (5) convulsions have occurred, probably of reflex origin.

Important Factors to be Remembered in Giving the Treatment.—(1) That the treatment involves one of the vital organs, the function of which has been interfered with; (2) the proximity of the heart, the function of which may also have been interfered with; (3) the dangers involved; watch the patient's color, pulse and breathing. Watch for coughing (which may result from pricking the visceral layer of the pleura), or expectorating, and watch for any symptoms of syncope; (4) the danger of further infection or of forcing air into the pleural cavity.

Method of Procedure.—The nurse's duties are to prepare the articles necessary for the treatment, to prepare the patient, to watch him during the treatment, and to assist the doctor.

The required *articles* are a rubber sheet to protect the bed; sterile sheets to render the surrounding area sterile, alcohol or iodine and sterile cotton to disinfect the skin, a sterile hypodermic needle and syringe and cocaine 2 per cent. for local anesthesia, sterile gloves and powder for the doctor, a sterile dressing and adhesive or a collodion dressing and the aspirating set. This consists of a graduated five- to eight-pint glass bottle provided with a rubber stopper in which there is a metal tube with two branches, each provided with stopcocks. To each branch is fitted a piece of rubber tubing provided with metallic ends. The sterile aspirating needle fits the metallic end of one piece of tubing and through the other air may be exhausted from the bottle, with an exhaust pump, leaving a vacuum in the bottle into which the chest fluid will readily flow.

When the air is exhausted from the bottle both stopcocks must be closed, but before starting the preparation for the treatment the apparatus must be tested to be sure the chest fluid will flow into the bottle. You test the apparatus by placing the tubing, which is to be attached to the aspirating needle, into a glass of water and opening the stopcock of that branch only; if the water runs into the bottle readily, the chest fluid will also do so when the needle is inserted into the pleural cavity and attached to the tubing.

The *position* of the patient is important. To lessen the danger of shock, of fainting or of fatigue, it is wise to have the patient lie on his unaffected side in a semi-recumbent position, on the side of the bed most convenient for the doctor. The arm of the affected side may be held above the head or held forward with the hand on the opposite

THORACIC WALL

shoulder. The position must be comfortable, involving no strain or exertion. Frequently the treatment is given with the patient sitting on the side of the bed, his feet resting on a stool or rung of a chair, his arms resting on a pillow on the back of the chair. Sometimes it is given with the patient leaning forward on a bed tray. He should be warmly clad (that is, he should wear slippers and stockings and his body and lower extremities should be well wrapped in gray blankets) to prevent chilling and lessen the danger of shock. Only the necessary exposure should be permitted.

The *skin* where the puncture is to be made is disinfected. Punctures are usually made in one of the following spaces: (1) in the sixth or seventh interspace in the middle axillary line or (2) in the seventh or eighth interspace just outside the angle of the scapula.

The needle is injected midway between the ribs to avoid the intercostal blood vessels and during inspiration when the spaces are wider. The greatest precaution should be taken to prevent the entrance of infection or of air.

After the treatment the patient must remain quietly in bed, in the recumbent position and no exertion or sudden movements should be allowed. The sputum should be watched for the presence of blood. Blood in the sputum following a chest aspiration may result from injury to a blood vessel.

THORACIC WALL, INJURIES TO

Injuries to the thoracic wall may be the result of bullets, stab wounds, or compound fractures of the ribs. The latter occur quite often following severe compressions of the chest, such as occur in "run-over" accidents. Wounds of the chest may be superficial, involving skin and muscle, or deep, penetrating the pleural cavity. The dangers of the last named variety are the complications of pneumo-thorax (air in the pleural cavity with collapse of the lung), hemo-thorax, a condition in which the pleural cavity is filled with blood due to injury of the blood vessels of the lung itself; or, the possibility of a superimposed infection of the pneumo-thorax (pyopneumothorax).

Treatment of Injuries to the Thoracic Wall.—This is usually surgical in nature. The wound is thoroughly cleansed and the hemorrhage controlled. If any of the ribs have been fractured, they are securely strapped and the patient kept in bed for a few days. Many of these cases, especially those with deep, penetrating wounds, develop serious complications, such as pneumonia, or infection of the pleural cavity (empyema).

THORIUM

See RADIUM.

THORIUM

THORNAPPLE

See STRAMONIUM.

THROAT, FOREIGN BODIES IN

It sometimes happens that a fish bone gets stuck in the throat, and it is impossible to reach it with the finger. In that case a raw egg swallowed quickly will generally carry it into the stomach. If a pin, a piece of glass, or any foreign body with a sharp edge is swallowed by mistake, do not give an emetic, but make your patient eat solid food, as potatoes or bread, so that the object may become embedded in the food and carried out of the system without injuring the intestines.

THROMBOPHLEBITIS

See PHLEGMASIA ALBA DOLENS.

THROMBOSIS (POST-OPERATIVE)

This may follow in the path of a phlebitis, and simply means the occlusion of the lumen of the vein with a blood clot. The same condition may occur in arteries. The symptoms are practically those of a phlebitis. The danger of these cases lies not so much in thrombosis itself, but in the fact that these thrombi may give rise to small particles of blood clots (emboli) which invade the blood stream and localize in any part of the body. The symptoms and physical signs depend on the area in which these emboli have lodged. If they should localize in the brain, paralysis may ensue, if in the central artery of the retina, blindness, if within the coronary artery of the heart, immediate death. A glance at these possibilities is certainly proof that a thrombosis is potentially a dangerous operative complication.

Treatment.—The acute condition is treated practically the same as a phlebitis, with the exception that the local applications vary, some using ice compresses over the veins, others a 20 per cent. ichthyol ointment, some the electric pad. All surgeons believe in absolute rest of the part involved. It is a good practice to keep the weight of the bed clothing away from the affected area, by means of a wooden or metal cradle. When all the acute inflammation has subsided, the patient should not be allowed up and out of bed until a good firm pressure bandage has been applied. In a leg case, the bandage is wound from the ankle upward to the knee. The patient should be warned that even after leaving the hospital, or home, a rubber stocking properly fitted should be worn for a long period of time.

THYROID EXTRACT

Of course when this condition involves the superficial veins it is not so very serious, but it has been known to choke off the femoral artery, the main channel through which the lower extremity gets its supply of blood. This might result in gangrene with subsequent amputation of the leg and thigh. These severe post-operative complications are fortunately rather rare.

See PHLEBITIS.

THYMOL

* **Thymol** is a chemical substance which resembles carbolic acid or phenol, chemically. It is principally used as an antiseptic, but it also has a specific destructive action on hook worms.

Administration

The bowels are thoroughly moved with a brisk cathartic the day before, and the morning before administration about 5 to 15 grains of thymol is given, and the dose is then repeated several times. About half an hour after the last dose, a dose of castor oil should be given.

See ANTHELMINTICS.

THYMUS

Thymus is a powder made from the fresh thymus of the calf. It is a gland situated in the chest, behind the sternum and probably regulates the growth of the child. It is used in the treatment of rheumatism and rickets.

THYROID EXTRACT

Thyroid extract is a powder made by grinding up the thyroid glands of sheep. Its active principle is a substance called iodothyrim.

The thyroid gland is a ductless gland which secretes a substance into the blood. This substance regulates the growth and development of the body. Thus, children who have a poorly developed thyroid gland are stunted in their growth, they develop pads of fat in the neck and other parts of the body, their intelligence is lessened, and they are dull and stupid (Cretinism).

The administration of thyroid extract to such children is followed by startling improvement of their intelligence, growth and development.

Old people in whom the thyroid gland has atrophied, so that its secretion is very much lessened, often suffer from similar symptoms; such as dullness of mind and drowsiness (myxedema).

These symptoms are relieved by the administration of thyroid extract. Dose is 3 to 10 grains.

THYROID GLAND

Poisonous Effects

“Hyperthyroidism”

When the thyroid gland secretes into the blood more substances than necessary, the following symptoms are produced. These symptoms frequently occur from certain enlargements of the thyroid gland (exophthalmic goiter or Graves' disease).

1. Rapid loss of weight.
2. Rapid, thready pulse.
3. Nervousness.
4. Bulging eyeballs (exophthalmos).
5. Diarrhea.

Thyroid extract is frequently taken to reduce weight in obesity. It is a dangerous remedy, as its continued use often produces the symptoms of hyperthyroidism.

THYROID GLAND

The thyroid is a small, flat, ductless gland lying against the fore part of the trachea, below the thyroid cartilage. It is of a deep red color, weighs about an ounce, and consists of two lateral lobes connected at their lower parts by an isthmus. The lobes are broader below and taper to a point above. Small masses of thyroid tissue are sometimes found along the trachea as far down as the heart. They are called **accessory thyroids**. Comparatively little is known about the action of the thyroid secretion, but much clinical evidence supports the theory that it is necessary for the continuance of normal metabolism.

THYROID GLAND, DISEASES OF

The word goiter is familiar to the lay mind, and even a layman distinguishes two types—the one in which there is simply an enlargement of the thyroid gland, and the other in which there is enlargement complicated by definite nervous symptoms. Just as in the pituitary, there may be an increase or perversion of the thyroid secretion known as hyperthyroidism, or there may be also a diminished secretion. If it occurs before the age of puberty, or dates from birth, cretinism results, or if it occurs in adult life, myxedema may occur.

Cretinism.—These children have a diminished thyroid secretion. As a rule they are fat and pudgy with coarse, sparse hair, unable to walk, and have a subnormal temperature; their mentality is practically nil. Thyroid extract given to these unfortunates often transforms them at least from an animal stage to a point where they can protect themselves sufficiently to exist.

Myxedema.—Very often patients in adult life begin to

THYROID GLAND

show signs of mental sluggishness with a slow reaction time, and their faces become coarse and mask-like. In other words, they are somewhat like a cretin. Thyroid extract or any preparation of the thyroid gland, given by mouth, helps these people markedly.

Goiter.—Any enlargement of the thyroid gland that is chronic in nature is spoken of as a goiter. The symptoms which come from the goiter are mechanical, and result from pressure of the enlarged gland upon those structures which it might compress. From pressing on the wind pipe (trachea) it may give rise to a cough, or it may cause difficulty in swallowing, by pressure on the gullet (esophagus).

Treatment of Goiter.—Goiter may be treated medically or surgically. Some cases respond to the internal administration of potassium iodide. X-ray, when given in graduated doses, sometimes reduces the size of the gland. But if the goiter is large and the symptoms are aggravating and persistent, surgery is practically the only measure which will afford relief.

Ante-operative Treatment.—On the morning of operation the neck should be shaved, cleansed with green soap and water, followed by alcohol and ether, and a sterile dressing applied.

Post-operative Care.—The patient should not be permitted to talk any more than is necessary for at least a week. Attention should be paid to the character and tone of the voice. The reason for this is obvious, when it is recalled that the nerves which partially control the vocal chords lie close to the gland and may have been injured or cut during the operation. This is indeed a serious complication, because if they are cut it will result in permanent alteration of the patient's voice.

It should also be remembered that occasionally patients run a high temperature, rapid pulse, and may even be delirious. The syndrome is often spoken of as acute thyroidism. This condition should be treated with ice packs, but this will be discussed at greater length in the treatment of exophthalmic goiter.

Exophthalmic Goiter

Symptoms.—Patients with exophthalmic goiter as a rule are recognized immediately by the fact that their eyes are prominent and protrude, and that they are extremely nervous. Their pulse rates vary from 90 to 120, and sometimes even higher. In other words, they have what is called *tachycardia*. Their skin, as a rule, is moist, and they perspire freely. A very definite swelling of the thyroid gland is often visible. These symptoms all point to a poisoning

THYROID GLAND

from either an increased amount, or a perversion of the thyroid secretion. It does not take much imagination to realize that, above all else, these patients need peace and quiet. They are nervous in the extreme. Association with others, incessant talking, and noises tend greatly to aggravate them and increase their pulse rate. The keynote in the care of these patients is rest under ideal surroundings, and treatment administered so tactfully and carefully that the shock to the nervous system will be as little as possible.

Treatment.—Medical.—All cases of exophthalmic goiter should, as a rule, be treated medically at first. The treatment consists of rest in bed, complete isolation from society, a diet of high caloric value with forced feeding, and the administration of sodium bromide to relieve the intense nervous excitement. Some physicians give iodine internally, and some use thyroid extract.

Surgical.—It is in the surgical treatment of hyperthyroidism that tremendous strides have been made. The patient at present is not operated upon the day after she enters the hospital. These highly nervous women are no longer subjected to the terror of being ridden directly to the operating room and arriving there with a pulse of 140; then, in their weakened condition, subjected to ether anesthesia and a shocking operation, with the result that having little stamina left, they usually succumb within twenty-four hours after a partial thyroidectomy has been attempted.

Ante-operative Treatment.—In the treatment of these cases it cannot be emphasized too strongly that great tact and care should be utilized by the nurse in charge so as to gain the absolute confidence of the patient. The room which the patient is to occupy should be bright, well ventilated and airy, away from all noise such as street cars, and busy corridors. The patient should be kept continually in bed, not even being allowed lavatory privileges. The diet should be plentiful, an accurate account kept of the food ingested, and the caloric value figured accurately, because it is imperative that these cases be given 5,000 calories or more of food a day. The patient should be kept quiet on liberal dosage of bromides, even to the point of bromidism. Visitors should be few, and their period of stay limited. All depressing topics of conversation must be omitted. Anything which would arouse the excitement of the patient, such as dazzling headlines in the current newspapers, melodramatic stories, and trashy magazines, must not be permitted. Since the slamming of windows and doors always causes a sudden shock to the patient, great care should be taken to see that it is not done. In other words, the medium in which the patient lives must be calm, serene and peaceful,

THYROID GLAND

As soon as the patient has sufficiently recuperated from the strangeness of hospital surroundings, and the pulse rate has fallen around 90, it is advisable to acquaint the patient with the fact that she is to prepare for operation. The anesthetist who is to give the anesthesia should be introduced; he should explain the operation of the gas mask, place it gently over the patient's head, teach her how to breathe through it, and just what she is expected to do. He should visit her daily and rehearse the little act of psychologically anesthetizing the patient. In the meanwhile the nurse should prepare the neck as if the operation were really to be performed. The anesthetization of the patient when possible should be done in her private room, and as the patient has become accustomed to the anesthetist, the mask and the preparation of the neck by the nurse, it is possible that the actual day of operation may be kept secret from the patient. In other words, the gland may be stolen away, the patient little knowing that one of the rehearsals with the anesthetist is the day on which the operation is to take place.

The anesthetic which is used is nitrous oxide and oxygen, and, in addition, the line of incision is usually first injected with novocaine, $\frac{1}{2}$ per cent. The operation is usually done in stages; that is, the blood supply to the thyroid is first lessened by the ligation of the superior thyroid arteries, and then the inferior thyroid arteries. This may be done under local anesthesia, or under gas and oxygen. The reason for the preliminary ligation is to diminish the blood supply of the thyroid. This simple procedure is very often all that is necessary, and with it the symptoms of hyperthyroidism abate, and the patient needs no further surgical treatment. If, on the other hand, the symptoms are not definitely improved, at least the blood supply of the gland is lessened, so that when the thyroid is removed, the hemorrhage will be materially decreased, the degree of shock less, and a speedy recovery of the patient assured.

Post-operative Treatment.—The patient should be kept especially quiet and given plenty of fluid by rectum. Very often these patients are subject to a sudden rise in temperature, sometimes as high as 106 degrees, and an increase in pulse rate that is rapid and thready. Their faces become pinched and covered with perspiration; they are apt to become delirious and die within a very short time. These symptoms are thought to be due to an acute hyperthyroidism. It has been found that as soon as these symptoms occur, they can be controlled by the use of the *ice-pack*.

Occasionally, following the operation there may be a hemorrhage from the operative wound. The bandage should be

TINCTURES

reinforced and the operating surgeon immediately summoned. More rarely a condition of edema of the glottis may develop. This is evidenced by difficulty in breathing, cyanosis of the patient, and a bubbling respiration. This condition demands immediate attention, often tracheotomy; and no time should be lost in summoning the medical officer in charge.

Following any operation upon the thyroid, especially of exophthalmic variety, the patient should be given a prolonged rest in some quiet mountainous resort. The surroundings should be congenial, and the patient should not be permitted to return to her usual environment until the attending physician feels assured that she can stand the strain.

Tetany.—Occasionally after rather an extensive removal of the thyroid gland, a peculiar condition may result, namely that of tetany. This is presumably due to the fact that the parathyroid glands which are closely attached to the posterior surface of the thyroid have been partially removed.

The symptoms of tetany are intermittent, bilateral spasms confined to the extremities. These paroxysmal attacks may be controlled by the administration of calcium lactate, about fifteen grains every three hours.

TINCTURES

Tinctures are dilute alcoholic extracts of drugs varying in strength from 10 to 20 per cent. The pharmacopeias of all countries now agree on 10 per cent. as the standard strength for tinctures of all powerful drugs. Tinctures of weak drugs are often 20 per cent. in strength. Tincture of iodine and tincture of iron chloride, which are not extracts, are alcoholic solutions and not real tinctures. When another fluid besides alcohol is contained in the tincture this is added to the name; for example, when the alcohol contains ammonia, the tincture is called an ammoniated tincture.

TOBACCO

Tobacco is the dried leaves of *Nicotiana tabacum*, a plant growing in tropical countries. It contains **nicotine**, a very poisonous volatile fluid alkaloid, and other substances.

Tobacco is not used as a medicine, but it is habitually used as a luxury by many individuals.

Tobacco, because of its nicotine acts like lobelia. **It lessens the contractions of all the involuntary muscles.** A strong cigar will often relieve an attack of asthma, by lessening the contractions of the involuntary muscles of the bronchi.

It increases the peristalsis and often acts as an excellent cathartic. It increases the flow of urine.

TONGUE, REMOVAL OF

In persons who do not smoke habitually, tobacco often causes nausea, vomiting, headache, dizziness and weakness. In those who smoke habitually, it does not produce such effects.

Poisonous Effects

Nicotine is one of the most violent poisons known. It causes symptoms like those of lobelia poisoning, which come on very rapidly and cause death.

Chronic tobacco poisoning is a frequent condition which follows excessive smoking. The symptoms are due to the nicotine which the tobacco contains. The patient usually complains of **palpitation of the heart**, he has a **rapid irregular pulse** and is **very nervous**.

TOLU

See BALSAM OF TOLU.

TONGUE, CARCINOMA OF

Treatment of Inoperable Cases.—While all patients suffering from inoperable cancer are miserable, there are none who present such a horrible spectacle as those with a large fungating growth of the tongue. Unable to swallow, finding difficulty in breathing, suffering agonies, with an oral stench which is hardly bearable for themselves or others associated with them, they are entitled to all the sympathy possible. If nothing else can be done for these unfortunates they may be kept absolutely free from pain. The local pain is sometimes reduced by dusting the ulcerated areas with orthoform powder. It is applied before any food is taken. Morphine should be given liberally, with a little atropine to prevent its depressing effects. The foulness of the breath may be lessened by the continual use of mouth washes and mouth irrigations. If dyspnea becomes marked because of crowding of the larynx by the growth, tracheotomy may be necessary. If difficulty exists in swallowing, rectal feeding may be given. Feeding by stomach tube or nasal gavage is not practical, because the rubber tubes coming in contact with the growths cause excruciating pain. Occasionally, the proper use of radium and X-ray, in selected cases, will do much to give relief where the knife has failed.

TONGUE, REMOVAL OF

Ante-operative Preparation.—This consists of the usual cleansing of the mouth as already outlined in operations upon the jaw.

Operation.—The anesthetic is administered intra-nasally. The mouth is kept open by a self-retaining gag. A heavy silk ligature should always be at hand for introduction

TONSILS

through the base of the tongue. This serves as a tractor, and even after the tongue has been removed the ligature is left in place, the free end being fastened either to the teeth, or identified by an attached pair of forceps that hang from the mouth. This ligature should remain in place for at least twenty-four hours after operation, for it is invaluable in controlling the base of the tongue should any serious hemorrhage occur.

Post-operative Treatment.—In those conditions in which either half or the entire tongue has been removed, the treatment of the raw denuded surface of the floor of the mouth is what most concerns us. The desideratum, of course, is to render this area aseptic. To attain this end, some operators use balsam of Peru, which is applied as gently as possible. The dusting of iodoform powder is to be condemned, as iodine poisoning may result. Other surgeons prefer the use of mild antiseptic sprays.

For about four days, the patient should be fed by enemata. Each morning the bowels should be washed out with a soap-suds enema followed by rectal feedings which are given, as a rule, every four hours. If the patient is very weak and emaciated, and demands more nourishment than can be given by rectum, a small stomach tube may be passed through the nostril into the stomach, and left in place. Some operators prefer that the patient be fed directly by mouth; a soft rubber catheter is passed along the normal side of the mouth permitting the patient to swallow the liquids which are poured slowly through the tube. Each feeding should be completed by the administration of sterile water, and the tube withdrawn, after which the mouth should be thorough cleansed. Soft diet may be given as soon as the wound heals and swallowing without difficulty is possible. The patient should be permitted to sit up in bed as soon as possible, and so as to afford better drainage to the secretions which collect in the mouth, the head should be kept bent slightly forward. These cases may be allowed up from bed on about the fourth day.

TONSILS

See PHARYNX.

TONSILLECTOMY

Tonsils are removed very often, both because of a diseased condition and because of an increase in size, or hypertrophy. As a rule the operation is attended with very little risk and is performed under ether in children, and with local anesthesia in adults.

Operative Treatment.—The patient, if a child, is placed

TRACHEA

under ether anesthesia in the dorsal position and the mouth held open by a self-retaining gag; an electric head lamp worn by the surgeon supplies the light. The tonsils are removed by one of several methods, either by blunt dissection with a Sluter tonsillotome, or they are dissected out with scissors, and finally enucleated with a snare. The hemorrhage is controlled by the simple pressure of gauze sponges. If necessary, the bleeding vessels may be tied, or a sponge with a piece of tape securely attached may be left in the tonsillar fossa for twenty-four hours. After the operation has been completed, to further stop bleeding and cause the patient to regain consciousness as quickly as possible, the neck and face are bathed with towels previously soaked in ice water.

After Treatment.—While these cases are apt to ooze a little after operation, careful watch should be kept on the pulse, and if they are bleeding briskly, as evidenced by the constant expectoration of bright red blood, or the vomiting of large quantities of altered blood, the attending surgeon should be notified immediately, for cases of fatal hemorrhage have been known to result.

The diet should be liquid; ice cream being given to children, for the cold is gratifying to the throat, and the psychic effect cheering to their depressed spirits, and, in addition, the cream forms a protective layer to the denuded areas of the pharynx. The patient is kept indoors for a day or two to prevent catching cold.

See PHARYNX.

TONSILLITIS

See PHARYNX.

TORSION

See HEMORRHAGE.

TOURNIQUET

See AMPUTATION.

TOXEMIA

See SEPSIS.

TRACHEA

The trachea, or windpipe, is a fibrous tube, about four and a half inches in length, and three-quarters of an inch from side to side. It lies in front of the esophagus and extends from the larynx on the level of the sixth cervical vertebra, to opposite the fourth or fifth thoracic vertebra, where it divides into two tubes,—the two bronchi,—one for each lung.

The walls are strengthened and rendered more rigid by

TRACHEOTOMY

hoops of cartilage embedded in the fibrous tissue. These hoops are C-shaped and incomplete behind, the cartilaginous rings being completed by bands of plain muscular tissue where the trachea comes in contact with the esophagus. Like the larynx, it is lined by mucous membrane, and has a ciliated epithelium upon its inner surface. The mucous membrane, which also extends into the bronchial tubes, keeps the internal surface of the air-passages free from impurities; the sticky mucus entangles particles of dust and other matters breathed in with the air, and the incessant movements of the cilia continually sweep this dirt-laden mucus upward and outward.

TRACHEOTOMY

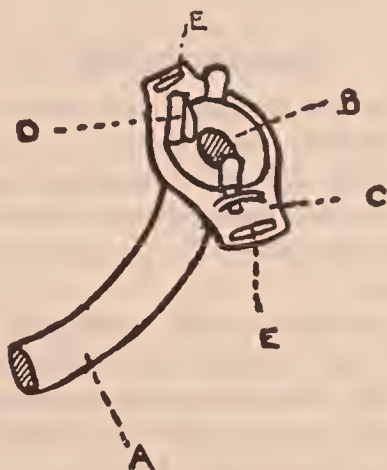
A tracheotomy is an incision into the trachea in order that a tube may be introduced therein, thus providing for the entrance and exit of air. This may be done either as an emergency measure following a thyroid operation in which the trachea has collapsed, when a foreign body has become lodged in the larynx so that respiration is embarrassed, in acute edema of the glottis, or in obstruction asphyxia during the administration of an anesthetic. It may be employed as a preliminary measure to a removal of the larynx for cancer. The operation is either high or low, the high being preferable, because the trachea is more accessible; the low being done when the operator has to reach a foreign body which has fallen into one of the bronchii.

Operation.—The patient is placed upon the back with a sand bag underneath the neck so as to make the trachea as prominent as possible. An incision is made in the mid-line, the muscles separated, the trachea exposed, incised, and a tracheotomy tube introduced. These tracheotomy tubes are of various types, but the one generally used is similar to that shown in the figure. It is very important, after the tube has been introduced, to see that it is patent, and that respiration is taking place freely. As a precaution, tape is usually threaded through the tube so that it will not slip down the larynx in any disorder which might ensue. Inasmuch as the outer tube comes into direct contact with the skin, it is a good plan to have a fine layer of gauze covered with boric ointment inserted between the tube and skin.

Post-operative Treatment.—The tracheotomy tube is a new passage through which air is drawn into the lungs, and since the air is no longer brought through the normal channels, it is important that above all the tube should be kept patent and clean. In order to ensure perfect cleanliness and free respiration through the tube, nurses must be on

TRACHEOTOMY

duty day and night ever alert to see that the patient has plenty of air. The inner tube should be removed about two or three times a day, cleansed, sterilized, and gently reinserted. It should never be cleaned in situ, i. e., as it rests in the patient's trachea. If at any time the tube should become suddenly plugged, the inner tube must be withdrawn immediately. At times the patient is apt to cough, and the mucus which makes its appearance at the orifice of the tube should be wiped away very gently. Occasionally from coughing violently both the inner and outer tubes may be expelled, and for this reason it is always important to keep a tracheotomy dilator on hand to meet this important



Tracheotomy Tube.

A, outer tube; B, inner removable tube; C, safety-guard; D, catch to hold inner tube in place; E, slot through which tape may be tied to hold safety guard in place.

(From Colp & Keller's Textbook of Surgical Nursing)

emergency. This instrument will keep this passage open until another tube may be obtained and inserted.

Another important thing in these cases is to remember that the air which is now inspired no longer has the advantage of being warmed and freed from dust by the nasal passages. For this reason in the beginning, thin layers of gauze which have been wrung out in warm water should be placed over the tracheotomy orifice and changed every half hour. Some surgeons keep the patient under a croup tent so that the air may be warmed by the steam and the respiratory tract have the advantage of a warmed air. Compound tincture of benzoin may be added to the croup kettles.

There are very few conditions which require more conscientious nursing than do these patients, because their life

TRANSFUSION

is absolutely dependent upon the uninterrupted inflow and outflow of air through the tube. They should never be left alone, for one never knows at what moment the tube may become plugged and the patient become suddenly asphyxiated. Occasionally mucus may collect in the trachea and not be expelled through the tube. The reason for this is that the cough is insufficient in strength to expel the mucous plug. In these conditions a sterilized feather might be introduced through the tube and the trachea tickled, so as to incite coughing. The time for the permanent removal of the tube is purely at the discretion of the surgeon. Very often some surgeons will remove the double silver tube and replace it by a rubber one, then remove the rubber one when they see fit.

TRANSFUSION

A transfusion is the transfer of blood from one person (the donor) to another (the donee or recipient). It has proved of great value in the following conditions:

1. Following a severe hemorrhage.
2. In hemophilia and other conditions with lessened coagulability of the blood.
3. In severe anemias (and leukemia). In secondary anemia it restores the volume of blood and tides over an emergency until the blood-forming organs can replace the loss. In pernicious anemia, an incurable disease, it gives temporary relief and prolongs life.
4. In collapse or shock from any cause.
5. In malnutrition or marked prostration.
6. In septicemia, in severe toxemia from sepsis, gas poisoning (carbon monoxide, etc.), or acid intoxication. Some of the poisoned blood may first be withdrawn and replaced by the donor's blood.
7. Before an operation when the patient is in a very weakened condition.
8. In patients suffering from malignant growths in order to increase their general resistance so as to guard against other diseases, such as pneumonia.

Effects of the Treatment.—Its advantages over the saline infusion are said to be that, (1) It supplies nutritive material, oxyhemoglobin, and carbon dioxide, and tends to overcome acapnia (diminished carbon dioxide in the blood), in shock; (2) it does not transude so quickly from the blood-vessels, and is not so quickly excreted as saline, and therefore maintains the blood-pressure in hemorrhage longer and causes increased coagulability of the blood.

There are certain *difficulties and dangers* encountered in a transfusion which necessitate the greatest caution, both in

TRANSFUSION

selecting and securing a donor, and in the method of collecting and transferring the blood. They are:

1. The difficulty in securing a donor, also the expense involved.
2. The danger of the blood clotting during the transfer.
3. The danger of injury to the blood vessels.
4. The danger of transferring diseases, such as syphilis.
5. The danger from incompatibility of patient's and donor's blood.
6. The possible collapse of the donor, and in some cases the veins of the recipient are small, collapsed, buried, and easily torn, making the treatment difficult.

Before using the donor's blood, to avoid the dangers of 4 and 5 above, it is very carefully examined. The following tests are made: A red and white blood cell count, hemoglobin determination, a platelet count (platelets are concerned with the clotting of blood), a Wassermann test to exclude the possibility of conveying syphilis, a test for "grouping," and a test for isohemolysins and iso-agglutinins.

Method of Procedure.—During the withdrawal of blood the donor should be in the recumbent position, made thoroughly comfortable, and allowed to remain in this position for some time following the treatment. Any nervousness on his part should be dispelled. His color, pulse, blood-pressure and general condition should be carefully watched, and stimulants should be in readiness and used if necessary. An extra blanket, and ice water, etc., should be at hand. An increase in the respirations and pulse rate, yawning or deep sighing indicate that the withdrawal of blood should be discontinued. Pallor and sweating sometimes occur followed by collapse.

For the withdrawal of blood the following articles are usually used: A rubber to protect the bed, sterile towels, a disinfectant for the skin, sterile cotton, sterile albolene (to coat the inside of needles, etc., to make the surface smooth and prevent clotting), needles, rubber tubing, a glass graduate to receive the blood, sodium citrate solution, 3 per cent., a small glass graduate with which to measure the citrate (50 c.c. of citrate solution are used to 500 c.c. of blood), a basin of warm water in which to stand the flask to keep the blood warm, a glass rod, and a sterile dressing.

The recipient must also be made quite comfortable and kept very quiet during the treatment. Restlessness and jerking of the arm make it very difficult to proceed, and may cause injury to the vein, displacement of the needle, hemorrhage, and loss of blood. The patient's color and pulse should be noted before the injection. During the treatment it is very satisfying and fascinating to watch the

TRICRESOLS

color gradually appearing in the finger nails, and lips, etc., and to note the increasing strength of the pulse.

The patient should be closely watched for symptoms of overdosage. An injection of too much blood may cause pulmonary edema and death. The symptoms of overdosage are distress about the heart, headache, backache, pains in the legs and a short, sharp cough. The latter symptom, particularly, indicates that only a limited amount of blood should be injected following it in order to avoid the danger of overdosage.

After Treatment.—After most transfusions there is apt to be a reaction manifested by chills and fever and sometimes nausea and vomiting. The nurse should always be prepared for this emergency. This may occur from ten to twenty minutes after the transfusion, and the treatment is the same as for any chill,—blankets, hot bottles and a little brandy, if permitted. It is advisable to save the urine of all these cases because it should be examined for the presence of altered blood. This will indicate whether the recently given blood has been of value to the patient, or whether it has been destroyed, and is being eliminated by the kidneys.

TRICRESOLS

See CRESOLS.

TRIONAL

Trional is a powder having a bitter taste. An average dose of trional usually produces natural sleep in about 15 minutes to an hour after it is given. The sleep lasts several hours and is accompanied by slight headache. The effects of trional are the same as those of sulphonal. It is more readily absorbed, however, and it does not affect the heart or respiration as much. It occasionally causes the same cumulative poisonous symptoms as sulphonal. Trional should be given about a half to one hour before bedtime in large quantities of hot milk or beer. Dose, 15 to 30 grains.

See SULPHONAL.

TRITICUM

Triticum is obtained from the *Agropyron repens*, or couch grass, a grass which grows in Europe and the United States.

Triticum is said to increase the flow of urine. It is usually given in the form of a decoction; about 2 to 4 drams in a large tumbler full of water.

Preparation

Fluidextract of Triticum; dose 30 to 60 minims.

TUBERCULOSIS

TROPACOCAINE

Tropacocaine is an alkaloid obtained from the leaves of the coca plant of Java. It is usually made artificially, however.

Tropacocaine is used principally to produce local anesthesia. Its effects are similar to those of cocaine, but they appear sooner, and last longer than those of cocaine. It does not dilate the pupil as much as cocaine.

Preparation

Tropacocaine Hydrochloride; dose $\frac{1}{2}$ to 1 grain.

This is used principally in 3 to 10 per cent. solutions.

And see COCAINE.

TUBERCULIN

Old Tuberculin is a solution obtained by filtering a bouillon culture of living tubercle bacilli through a Berkefeld filter and adding a little glycerin to it as a preservative. It contains the toxins of the tubercle bacilli. It is now only used to diagnose tuberculosis, either by injection, which causes a rise in temperature, or by the application to the skin.

New Tuberculin is made by grinding up tubercle bacilli and mixing them with equal parts of water and glycerin.

TUBERCULOSIS

Human tuberculosis is an infectious disease like diphtheria, or typhoid fever, due to similar germs spread in exactly the same ways, having similar stages, and controllable by like methods. But it is long drawn out; it is chronic rather than acute; it is mild and slow, not severe and rapid.

Carriers in the true sense are not widely recognized, and immunity, although demonstrated, is slow in development and perhaps slight in degree. No specific treatment is known, although tuberculin seems to help in some forms.

The treatment of tuberculosis is the treatment of all infectious diseases for which we have no specific antitoxin or other specific agent, i. e., the treatment is the same as for scarlet fever or for mumps—rest in bed, proper nourishment, fresh air, and care of incidental infections, with the hope that these measures will keep the patient from dying long enough for the patient to make his own antidotal bodies, or at least develop sufficient fibrous tissues about the lesions to limit further growth. Corresponding to the long drawn-out character of the disease, these factors in treatment take on peculiar emphasis and interrelate even more importantly than in the acuter diseases; but they are nevertheless the same factors.

TUBERCULOSIS

Under the term tuberculosis two separate diseases exist in the human, one derived almost exclusively from cattle, through drinking raw cow's milk; the other almost exclusively from human cases, through the mouth discharges of infectious stages of the pulmonary disease. The former affects chiefly children and is almost unknown after sixteen years of age; the latter affects chiefly adults, and, as an infectious stage of the pulmonary disease, is almost unknown before sixteen years of age.

See INFECTIOUS DISEASES, COURSE OF.

TUBERCULOSIS, NURSING CARE IN

The modern conception of tuberculosis brings new duties and responsibilities to every nurse. The fact is now thoroughly established that at least 90 per cent. of all adults who live a highly organized community life have been infected by the tubercle bacillus, and that two-thirds of all the children have acquired a first infection by the time they are fifteen years of age. Surveys and studies made in different parts of the United States at different times have indicated that about 1 per cent. of the population is suffering from active tuberculosis all the time, which means about 1,000,000 people in the whole country; 120,000 of these patients died in 1920. Do not these facts furnish an imperative reason why every nurse should be thoroughly informed in regard to the symptoms and nursing care of this preventable disease? It is now generally believed by the best authorities that an infection once established may persist for years through many recurrent periods of activity and quiescence, dependent upon circumstances in the life of the individual, and that it is finally some adverse condition which leads to the development of manifest tuberculosis in the lungs.

Some knowledge about the conditions favoring such breakdown is necessary in order to intelligently carry out the methods of treatment necessary for recovery and to educate the patient in regard to the living habits which he must maintain to prevent a recurrence of active disease.

Conditions favoring development of active disease:—

Other diseases (pneumonia, pleurisy, measles, whooping cough, influenza, etc.); mental and physical stress and strain; pregnancy, parturition, and lactation; malnutrition; unsanitary living or working conditions; dissipation; injury.

Symptoms of active disease:—

Lassitude; weakness; cough or hoarseness extending over a number of weeks; expectoration; elevation of temperature in afternoon or evening; increase in or irregularities of the

TUBERCULOSIS

pulse rate; digestive disturbances; nervous instability; dyspnea; pain in the chest; underweight or loss of weight; loss of appetite; night sweats; slow recovery from other diseases; hemoptysis.

Frequent Complications:—

Tuberculosis of the larynx and intestines; hemorrhage; pleural effusion; spontaneous pneumothorax.

Precautions against the spread of infection:—

Tuberculosis is classed with the communicable diseases, but differs in many respects from most of the others with which we are familiar. The tubercle bacillus, the infective agent, may attack any tissue in the body and thus we have many different types of the disease, which may be classified as to point of attack and according to age as follows: *In infants*, generalized, disseminated, acute; *in children*, bones, joints, lymph nodes, meninges; *in adults*, chiefly the lungs, but also the skin, kidneys, intestines and any other tissue.

The most dangerous type from the point of view of infection is pulmonary tuberculosis. Many patients, however, with a considerable degree of active disease in the lungs raise no sputum; and frequently, when sputum is present, repeated laboratory examinations fail to disclose the bacillus. On the other hand many people with no apparent active disease may be "carriers" and therefore sources of danger. The only safe procedure is to practise the same rigid sputum technique with every patient having pulmonary disease. All secretion from the lungs, nose or mouth must be considered as potentially dangerous. The patient should be taught never to cough or sneeze without covering the mouth and nose. For this purpose paper handkerchiefs are much to be preferred and each one should be used only once. Old pieces of cloth may be used in the same way. Where the sputum is scanty these pieces of cloth may be cut into small pieces, but a sufficient quantity of cloth should be used to absorb all the moisture without soiling the fingers. After using, the handkerchief should be placed by the patient in a paper bag (oiled or waxed bags can be procured for this purpose) or in a pocket folded from a newspaper and pinned to the mattress within easy reach. The bag with its contents should be collected and burned at regular intervals. Ambulant patients may carry the paper bag in a pocket, folding the handkerchief together carefully after using so as not to soil the edges of the pocket. When a patient raises a large amount of sputum, a folded paper sputum cup in a metal frame or holder with a cover may be necessary. Constant vigilance will be required to see that the edges and sides of the cup or container do not become soiled with the sputum which

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may subsequently dry and release the bacilli to be scattered in the dust and air. The menace of flies in this connection must also be considered.

A point always to be remembered is that *liquid sputum will not burn* and it is absolutely necessary that it should be mixed with some absorbent material (sawdust, heavy absorbent paper, etc.) before being consigned to the fire. If it should be impossible to burn the sputum it should be thoroughly disinfected before being disposed of in any other way. Carbolic acid in 5 per cent. solution is usually preferred for this purpose. Bichloride of mercury should not be used, as it hardens the albuminous material in the sputum and therefore may not be able to penetrate the mass. Lysol or other standard coal-tar disinfectants may be used. In the care of the patient's room, bed and body linen, dishes, etc., the ordinary routine for all infectious diseases should be carried out.

Nursing Care.—The fundamental factors in the treatment of tuberculosis in order of their importance are (a) rest, (b) food, (c) fresh air, (d) discipline and strict regimen under medical supervision. This treatment usually means almost a complete reversal in the mental and physical habits of the patient, and the result depends to a very great degree upon the attitude of mind which will govern his actions. "The will to be well" which keeps a patient faithfully following day after day the regimen prescribed by his physician will often be the determining factor in his recovery. The responsibility of impressing this fact with the necessary emphasis upon the consciousness of the patient rests first with the physician, and second with the nurse. The measure of success attained by the nurse will depend largely upon her knowledge and understanding of the principles and practice involved, her interest in studying the personality of the different patients, and her ability to translate her knowledge in such a way as to secure the earnest coöperation of each patient.

Rest.—The word rest as applied to the tuberculosis patient is a very definite term; and the nurse in charge is responsible for ascertaining its limits, and seeing that they are not exceeded. The hours to be spent in bed or chair should be prescribed by the physician; and the nurse must see that these orders are as strictly carried out as are those for the giving of medicine. Since the bed or chair should be in the open air, the chief problems for the nurse are those of making the patient comfortable—in winter protection from wind and cold, in summer from sun, wind, dust and insects.

Protection from cold.—For protection from cold remember that the object of clothing is to prevent the escape of

TUBERCULOSIS

bodily heat into the surrounding air. In bed the patient should be as carefully protected from underneath as from above. Two mattresses, folded blankets, or a comfort on top of the mattress, and heavy sheets of paper under the mattress, are all effective for this purpose. Care should be taken that the upper covers are not so heavy as to tire the patient with their weight. The patient should have an extra suit of underwear for the night and the sheets should be made of outing flannel, or light weight cotton blankets may be used. A blanket, one end of which is placed cross-wise under the mattress, and the other end brought up over the bed after the patient is installed therein, and tucked securely in on the opposite side will prevent the covers from being loosened and the heat within from escaping. A blanket folded loosely lengthwise and placed in the bed on each side of the patient will often prove the best method for protecting those who are apt to feel chilly towards morning. Hot water bottles and jugs, electric pads, etc., may be used, if necessary, to keep the patient comfortable, but it is better to do without them whenever other means can be devised. The head should be protected by a cap or hood which will fit closely to the face.

Sitting out of doors.—When sitting out of doors, the type of chair is of first importance. It should have a firm back so that no rounding of the shoulders will be induced, and it should give support to every part of the body including the feet.

Food.—To plan an adequate diet for a tuberculous patient it is necessary to understand thoroughly the factors involved, which are: (a) the objects to be attained; and, (b) the foods which will supply the elements needed to secure the desired result. The chief object is to build up and maintain the weight of the patient at about ten to fifteen pounds above his normal weight before he began to be affected by the disease. Care must be exercised continually that the digestion of the patient is not upset and his appetite diminished by over feeding or monotony in the diet. This requires a knowledge of food values, the relative requirements as to proteins, fats and carbohydrates, and careful observation and study of the tastes and idiosyncrasies of the individual patient. A slow, steady gain in weight with a corresponding increase in strength is a better indication of an adequate diet than a rapid fattening process without other signs of improvement. Three good meals a day, with a mixed diet, which includes such a quantity of milk as the patient can take without affecting his appetite for the other articles on the menu, will give the best results in the majority of cases. Faithful adherence to the directions for

TUBERCULOSIS

rest in the open air will be a great factor in maintaining good digestion and appetite.

In certain complications such as tuberculosis of the larynx, intestines, hemorrhage, etc., special diets are required. These should be prescribed by the physician.

Fresh Air.—For patients who cannot for any reason “take the cure” in a sanatorium, home arrangements should approximate sanatorium conditions as nearly as possible. If a porch is not available, the bed patient should have as large a room as possible, where cross ventilation may be secured and where the windows are so located that the sun may shine in for at least a portion of the day. The bed should be so placed that while protected from severe draughts, a constant circulation of air goes on around the patient’s head and shoulders. The patient must be so clothed as to be perfectly comfortable, and the windows should not be closed, except for short intervals when absolutely necessary, even in time of rain or snow. The results of this treatment as manifested usually in relief of cough, disappearance of night sweats, increase of appetite, improvement of digestion, relief of insomnia and lowering of fever, soon bring to the patient such a sense of improvement that he will sometimes protest against even a temporary closing of the windows.

Discipline and strict regimen.—There is probably no other disease where careful and persistent attention to the small details of treatment have so great a bearing on results. Dr. Lawrason Brown of Saranac Lake says, “To get well from tuberculosis means that a patient must pay attention to every little detail. He must watch and make no mistakes, for these often prove fatal.” Hence it is the duty of every nurse who assumes the care of such patients to make herself thoroughly familiar with every detail concerned with the treatment of tuberculosis by study of some good modern text book on the subject, and by reading such articles as are published from time to time in the medical and nursing journals. Further information may be obtained by writing to the National Tuberculosis Association, 370 Seventh Avenue, New York City.

Cough.—The patient must be taught to control his cough in large measure (a) by avoiding exciting causes so far as possible such as loud talking, laughing, etc., and (b) by adopting various simple devices which experience has shown to be effective, e. g., sips of cold water, slow full breaths, holding the breath, etc. For morning cough when severe, a glass of hot water with lemon juice, or a cup of hot milk or other hot drink before the patient gets out of bed may help. Cold packs on the throat are sometimes ef-

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fective. Drugs should only be given as prescribed by the physician.

Nightsweats.—Nightsweats in tuberculosis are usually a sign of weakness or of lack of sufficient ventilation. Sleeping in the open air is the best preventive treatment. Change the position of the patient's bed, if within a room, so that a greater current of air may flow around it. Friction of the skin with tepid vinegar or alcohol and water may prove effective.

Hemorrhage.—Every nurse caring for a tuberculous patient should get from the physician in charge detailed standing orders for procedure in case of hemorrhage, as individual physicians prefer different methods. This emergency usually occurs without warning and calls for immediate action. The chief indications for treatment are to secure as nearly as possible absolute rest of the part affected, to reduce the blood pressure, and to increase the coagulability of the blood. The first duty of the nurse is to reassure the patient, who is apt to be frightened, and to begin at once the treatment prescribed. The patient is usually put into a semi-sitting position, and the nurse should in every way possible help the patient to maintain a perfectly tranquil, relaxed attitude. There are various drugs which may be employed to advantage, but they should be used by the nurse only with the direction of a physician.

Pleurisy.—*Symptoms*:—pain in the chest; dyspnea; cough.

Treatment:—external applications to produce counter irritation may give relief from pain. Salicylates or aspirin are often given. In cases where the pain is very severe it may be necessary to strap the chest with adhesive plaster. The patient should be kept in bed.

Spontaneous Pneumothorax.—*Symptoms*:—The attack comes on very suddenly, usually after some exertion, particularly a severe paroxysm of coughing. On taking breath, the patient feels a sharp pain in his side, and rapidly develops extreme difficulty in breathing, followed by the characteristic symptoms of shock (rapid, feeble pulse; cold, clammy extremities; drawn look in the face, etc.). The respirations are rapid and shallow, and the temperature drops to subnormal. In severe cases the patient may live only a few hours; but in the majority of cases the circulation gradually becomes adjusted to the changed conditions; the dyspnea is relieved though the respiration remains considerably increased for some time; and the temperature rises to above normal.

Treatment:—A hypodermic injection of morphine is usually prescribed to control the pain and the usual measures to counteract shock are employed, namely, heart stimulants

TURBINATES, HYPERTROPHY OF

and external heat. If the pain is not relieved by the morphine and the case is seen to be desperate, the physician sometimes punctures the thorax with a hypodermic needle to allow the escape of air.

Conclusion.—The preceding paragraphs have dealt almost exclusively with the physical aspects of the sick, tuberculous patient. The service and the responsibility of the nurse should not in any sense be limited to this one phase of the tuberculosis problem. To bring about the arrest of active disease in a patient is not enough, as experience has clearly shown. The “cure” cannot be pronounced permanent until the patient is returned to active productive life among his peers. This fact must be kept in mind from the very day the treatment begins and its whole course must be shaped accordingly. To the purely medical treatment must be added thorough education in the hygiene of prevention (both in regard to the spread of infection and the recurrence of active disease), and such intellectual and vocational training as is indicated in each individual case.

The nurse should play a very large part in this rehabilitation program, as the morale of the patient is influenced very greatly by the inspiration and encouragement (or lack of these) which she can give him.

TURBINATES, HYPERTROPHY OF

See NOSE.

TURPENTINE (TEREBINTHINA)

There are two kinds of turpentine: **turpentine** or **white turpentine**, and **Canada turpentine** or **Canada balsam**.

Turpentine, or white turpentine, terebinthina, is a thick resinous substance, or solid oleoresin obtained from the sap of the **Pinus palustris**, and other species of pine trees.

Canada turpentine, **terebinthina canadensis**, or Canada balsam, or balsam of fir, is a liquid oleoresin obtained from the **Abies balsamea**, the American silver fir, or balm of Gilead tree, which grows in the northern parts of the United States. This form of turpentine is seldom used. The turpentines contain a volatile oil, oil of turpentine, or spirit of turpentine, which causes their effects.

Local action: Turpentine or the spirit of turpentine, reddens the skin. If it is kept on the skin for any length of time, it causes blisters.

Internal Action: When taken internally, the oil of turpentine produces the following effects.

In the stomach: It checks the formation, and hastens the expulsion of gas. Part of it is absorbed into the blood from the stomach.

TURPENTINE

In the intestines: It acts as an antiseptic, checking the growth of bacteria. It expels gas and increases peristalsis. It is said to expel worms.

On the kidneys: Turpentine and the oil of turpentine increase the flow of urine. This effect is produced by the turpentine after it is absorbed into the blood.

Turpentine is said to make the pulse somewhat stronger and faster.

Excretion

Turpentine is eliminated from the body by the lungs, where it increases the cough and expectoration, and acts as an antiseptic. It is also excreted by the kidneys and gives the urine a violet color.

Poisonous Effects

Overdoses of turpentine cause:

1. Unconsciousness.
2. Scanty, often bloody urine.
3. Rapid, feeble pulse.
4. Occasionally vomiting, and diarrhea, with painful stools.

Uses

Turpentine is applied to the skin to relieve pain and to withdraw blood from the deeper tissues; occasionally to form a blister.

To increase the flow of urine.

To expel gas from the intestines.

To increase the cough and expectoration, and to check the growth of bacteria in the lungs.

Turpentine destroys tape worms and round worms.

It is given in doses of one ounce with twice its amount of castor oil. It is also given in very small doses, together with other anthelmintics. It is very apt to cause poisonous symptoms and is therefore not frequently used.

Administration

For its effects on the skin, turpentine liniments are used, or the drug is applied in the form of a "stupe." (See FOMENTATIONS.)

Internally, turpentine is best given in capsules or in an emulsion. As an expectorant, it is frequently given by inhalations.

Turpentine is also often added to enemas to help the expulsion of gas.

Preparations

Oil of Turpentine; dose 5 to 15 minims.

This is obtained by distilling turpentine.

TURPETH MINERAL

Purified Oil of Turpentine; dose 5 to 15 minims.

Emulsion of Turpentine Oil; dose 1 dram.

Turpentine Liniment.

TURPETH MINERAL

See EMETICS.

TWILIGHT SLEEP

See SCOPOLAMINE-MORPHINE ANESTHESIA.

TYMPANITES (POST-OPERATIVE)

The distention of an abdomen following operation is due to a gastric dilatation, a distention of the small or large intestine, or a dilatation of the bladder resulting from urinary retention. The word tympanites or meteorism denotes an inflation of the abdomen with gas. This gas is usually intestinal; occasionally it may be free in the peritoneal cavity from a perforation of the intestines. A condition of gastric dilatation is recognized by distention in the upper abdomen; that of the small or large intestine, by a generalized abdominal distention; that of the bladder by palpation of a rounded mass just above the pubes and the failure of the patient to void urine after operation. Tympanites is certainly distressing and modern surgical nursing commands many methods to alleviate and relieve this condition, bringing much comfort to the patient.

Treatment.—The theory underlying all treatments is to aid the patient in ridding the small intestines and colon of gas. The means for accomplishing this are many. One of the simplest procedures and one of the most efficient is the introduction of a rectal tube.

A *rectal tube* is a small piece of rubber tubing about three-eighths of an inch in diameter, rounded at one extremity. This is well lubricated with either K-Y or vaseline, and gently introduced into the rectum beyond the internal and external sphincters, and about three to four inches beyond the anus. The purpose is to form an exit for gas which may have accumulated in the colon. This simple procedure is often all that is necessary. Other procedures are purgative enemas and colonic irrigation. (See ENEMAS and COLON IRRIGATIONS.)

TYPHOID OR ENTERIC FEVER

Typhoid fever is an acute, general, specific, infectious, communicable disease with local lesions in the intestines.

Nursing Care and Treatment.—Dr. Osler has said that “careful nursing and a regulated diet are the essentials in a majority of cases,” and that the disease can only be

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modified by placing the patient in the best possible mental and physical condition to withstand the invasion of the bacteria and their toxins. It is a disease in which attention to the little details is most important and brings the best results.

"That sufficient physical and mental rest and sleep are obtained, if possible," is the first important factor. "Real rest can be obtained only by careful and competent nursing."

Rest means not only rest in bed, but in a comfortable bed, free from all sources of discomfort. The position must be comfortable, never strained, to avoid pain or other discomfort. The patient should never be allowed to sit up. The position should be changed frequently, but the patient should not be allowed to move himself. All exertion must be avoided in making the bed, giving a bath or other treatments, using the bedpan, and in feeding him, etc. Every movement is a waste of energy so everything should be done for him. Mental rest—freedom from cares, anxiety, excitement and all mental demands, all of which cause fatigue—is essential. Nervousness and excitement during treatments, or due to forced diet, etc., must be avoided. No visitors should be allowed; the mental effort of listening to or keeping up a conversation causes an elevated temperature, a rapid pulse, restlessness, and wakefulness. Cold baths usually relieve nervousness, excitement and wakefulness; sometimes chloral, bromides or opium is necessary.

The room (in a private home) should have, as far as possible, all the characteristics of the hospital ward—large, well ventilated, proper lighting, free from unnecessary furnishings, quiet, systematic, orderly, no visitors and with proper facilities for the disposal of discharges, etc., and the care of linen. The *bed* must be clean, comfortable, dry, free from wrinkles, crumbs or any other source of discomfort or cause of bedsores. It must be well protected as the patient is apt to have involuntary movements. It must not be too warm and the clothes, particularly over the toes, must not be too tight.

The Patient.—He should have a daily cleansing bath and everything about him should be kept sweet and clean. His hands should be washed several times a day. A delirious patient is apt to contaminate his hands with fecal material and reinfect himself. The position must be the constant recumbent, but should be changed frequently to avoid pneumonia and pressure sores.

Bedsore.—The marked emaciation, the destructive effect of the fever and toxins, the impaired metabolism, poor circulation, low blood-pressure (shown by the patient's dusky hue), the prolonged illness, and the profound involvement

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of nerve centers make even slight pressure a source of great danger. The patient may lose control over the bladder and rectum and this adds to the danger. The proper care of the skin, the cold sponge and cold tub-baths by stimulating the circulation and the functions of the skin aid greatly in preventing bedsores.

The care of the mouth and nose is extremely important. A neglected mouth may cause infection of the ears, tonsils, lungs, parotid glands, erysipelas, and the patient may reinfect himself with typhoid. It makes the patient uncomfortable, has a depressing mental effect, destroys the appetite, upsets the stomach and digestion.

The mouth must be kept clean and moist. It should be cleansed morning and evening and after each feeding. Care must be taken not to cause the patient to gag, also to avoid injury to the delicate mucous membrane. Cold cream should be applied to the lips and tongue half an hour before cleansing to soften a tender or badly coated tongue. Plenty of water to drink aids greatly in keeping the mouth in good condition. Bits of cracked ice to suck relieve the dryness and thirst.

Headache is a common and most distressing symptom. It should be relieved by the application of an ice-cap or ice compresses to the head.

Backache and Aching Limbs.—The spine is frequently very tender and pains in the back and limbs may cause great suffering. Pillows should be arranged so as to support the back and keep the tender spine entirely free from the bed.

Sleeplessness is the most exhausting symptom. It is relieved by hydrotherapy, chloral, bromides, or morphine, etc.

Thirst is a constant source of discomfort. Even though the patient be too dull to ask for it, water should be given freely. One of the principles of treatment is to give water regularly and freely.

Cold hands and feet, resulting from the low blood-pressure and poor circulation, are often a source of discomfort. A hot-water bottle should be applied.

Retention of urine often occurs and should be looked for. The bladder must be emptied by nursing measures used to relieve retention or by catheterization.

Abdominal pain, tenderness, and distention are distressing symptoms which must be particularly guarded against. Distention may develop into the dreaded tympanites—dreaded because it predisposes to perforation and peritonitis and once developed is difficult or impossible to reduce. It is prevented by carefully regulating the diet, by giving plenty of water and preventing the accumulation of fermentation sub-

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stances in the intestines by keeping the bowels open. Frequently a daily cleansing enema is given. The cold baths also help to prevent distention by improving the muscular tone of the intestines. Turning the patient also helps to prevent the accumulation of gas.

Maintaining Vital Resistance by Proper Feeding is the third important factor. The diet is an extremely difficult problem and doctors differ widely in what they consider safe for the patient. Some believe in a very *low diet*, almost starving the patient. Others believe in giving a *high caloric diet*—"as much food as the patient will take and handle well." This varies with the patient, depending upon the appetite, gastro-intestinal disturbances, and toxemia. The high caloric diet is regulated by the following principles (Coleman):

1. That the minimum daily caloric requirement is 41 calories per kilo.
2. That the optimum daily caloric allowance is 60 to 80 or more calories per kilo, the average for a man weighing 150 pounds being 4000 calories.
3. That the minimum amount of protein should be given, sufficient to meet the body needs without taxing the tissues, the kidneys and other organs of elimination.
4. That fats should be given with care on account of the difficulty in digesting them and their tendency to cause diarrhea and other gastric disturbances.
5. That carbohydrates are the most efficient energy producers and are the great protein spacers.

The optimum daily protein allowance is 75 to 100 gm.

The daily carbohydrate allowance is 250 to 800 gm.

The daily fat allowance is 50 to 200 gm.

The basal diet consists of milk, cream, eggs (raw, soft-boiled, or soft-poached), milk-sugar, stale bread, or toast and butter. Milk substitutes and milk preparations are used—buttermilk, kumyss, cocoa, whey, junket, custard and ice cream, etc.; strained gruels, boiled rice or macaroni, baked potato, apple sauce and liquids, such as lemonade, orangeade, tea and meat broths, etc., are also included in a high caloric diet.

Whatever feeding is ordered by the doctor for the patient, the following principles must be observed by the nurse: All feedings must be given regularly and at stated intervals. The patient must never be forced but should be encouraged to take all the food allowed, the nurse remembering the importance of the diet in the patient's recovery. The fancies of the patient must be considered as far as possible; avoid things disliked, because they spoil the appetite and turn the patient against all nourishment. Note whether foods dis-

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agree or not; watch for a coated tongue, nausea, a sense of fullness, distention or diarrhea, and examine the stools for curds of milk and for undigested fat. Milk diluted with lime water or vichy is more easily digested—adding a pinch of salt also makes it more palatable and more easily digested. Give sweet milk very slowly, a teaspoonful at a time to prevent the formation of solid curds. When sweet milk is not taken well, buttermilk may be given. It is more easily digested, causes less nausea; distention, and diarrhea, because the fat is removed and the casein is finely divided owing to the lactic acid present and the mechanical action used in removing the cream or fat. Milk sugar is used instead of cane sugar because less sweet (sweet things are always nauseating to sick people), and because it ferments less easily. With many, however, it causes nausea, vomiting and distention; watch for this effect. Cold weak tea will often settle an irritated stomach. Meat broths have no caloric value and should not be considered as nourishment given, but they are tasty and improve the appetite. See that they are properly seasoned and varied as far as possible. They must not be given if diarrhea is present. Lemonade, orangeade and imperial drink are grateful and refreshing to the patient. They are a means of supplying water and sugar to the tissues; they help to keep the mouth in good condition and have both a laxative and diuretic effect. *Water* should be given at regular intervals whether the patient seems to be thirsty or not. Two or three quarts and more, if possible, should be given daily.

When feeding the patient all exertion must be avoided. A glass drinking tube may be used, but if the patient is delirious or in a stuporous condition, he should be fed with a teaspoon. As a rule, patients are not awakened at night from a natural sleep for nourishment, but a dull, stuporous condition must never interfere with the regularity of the feedings.

Alcohol is used, by some doctors, in some cases.

"The Elimination of Effete Materials by the Kidneys, Bowels and Skin."—Every avenue of escape must be kept open for the elimination of toxins and other waste products.

The *skin* is kept in good condition and elimination stimulated by giving plenty of water to drink, by cleansing baths, by cold sponge or tub baths, by alcohol rubs and massage and by general improvement of the circulation.

The *kidneys* are stimulated and flushed, the toxins are diluted and eliminated by giving large amounts of water, lemonade and imperial drink, etc. The kidneys are rested by giving a minimum protein diet and aiding elimination by

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the skin and intestines. Cold sponge and tub baths stimulate the kidneys and aid elimination.

Typhoid bacilli may be eliminated in large numbers in the urine, particularly if there is any interference with the proper flushing of the kidneys and in retention of urine. Urotropin is given as a urinary antiseptic. When retention of urine must be relieved by catheterization, extreme care must be taken to avoid infection, as the weakened bladder and lowered resistance make it very susceptible to infection by pathogenic organisms.

Proper *elimination from the bowels* is extremely important. The intestine is the seat of the local lesions. The patient should be watched for symptoms of distention and the stools watched for the presence of flatus, undigested food and blood. A daily cleansing enema is frequently given—care must be taken to avoid force or pressure and exertion or straining on the part of the patient. The enema should be small and not high. Great care must be taken in the use of the bedpan, also to avoid exertion. When lying down, the elevation of the hips on the bedpan always causes some strain and difficulty in movement, so that in some cases (when hemorrhage and perforation are particularly feared), even this slight exertion is not allowed. A large pad is used in place of the bedpan. The recumbent position is always maintained unless otherwise ordered. If tympanites develops it is treated by the insertion of a rectal tube, carminative enemata, the application of turpentine stupes to the abdomen and careful regulation of the diet.

The Relief of Toxemia.—Toxemia may be very severe, particularly in the second and third week, and may cause death. It is relieved by carefully regulating the diet, keeping up the resistance, giving plenty of water, aiding the elimination and by the use of cold air and cold tub or sponge baths. For the effect of the cold baths see BRAND BATH.

Complications to be Guarded Against.—Typhoid fever is not feared so much for itself as for the complications which are apt to develop. Without complications the fever runs its course and the patient usually gets well. It is, therefore, important to know how to guard against such complications, to recognize their symptoms, and to know what to do should they develop. It is important to remember that the height of the fever and the severity of the attack have nothing to do with the danger of complications, as they are just as likely to occur with a light attack. Good nursing does, however, help in lessening the danger of complications.

The complications which may develop are a recrudescence

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or relapse, hemorrhage, perforation, cholecystitis, meningitis, phlebitis, thrombosis, pulmonary embolism, pneumonia, parotitis, otitis media, mastitis, bone lesions and arthritis.

The end of the second and during the third week is the most dangerous period, owing to the patient's weakened condition and lowered resistance. Necrosis, sloughing and ulceration of the intestinal lesions occur so that hemorrhage and perforation are particularly to be feared during this period. A sudden rise or fall in the temperature, or a sudden change in the pulse rate usually indicates complications. Chills may precede pleurisy, pneumonia, otitis media or parotitis, etc. Severe headache may indicate meningitis. The prognosis in hemorrhage or perforation is always very grave.

A **hemorrhage** usually comes without any warning. The *symptoms* are a sudden fall in the temperature, sometimes a sensation of sinking and at the same time or later, the appearance of blood in the stools. There may be pallor, cold extremities, clammy sweat, a rapid, thready pulse, restlessness and air-hunger. The *treatment* is to stop all food, keep the patient at absolute rest, moving him only when absolutely necessary, an ice-coil to the abdomen, and the administration of calcium lactate or an injection of horse serum or human serum to aid the clotting of blood. Morphine may be given to insure absolute rest of the patient and of the intestines. No bowel movements are allowed for two or three days and then with caution. When the loss of blood is so severe as to deprive the vital centers and the heart, it should be treated like any other hemorrhage by elevation of the foot of the bed, heat to the extremities and transfusion, etc.

Perforation is even more dangerous than hemorrhage. The only hope for the patient is in its early recognition and immediate operation to close the perforation. It is due to ulceration or to distention with rupture of the weakened wall. It is most apt to occur in the third or fourth week. The *symptoms* are a sudden, sharp abdominal pain, a rapid rise in leucocytosis followed by the symptoms of general peritonitis—a rapid, thready pulse, rapid, shallow respirations, the temperature may fall, then rises, pallor, a pinched, anxious expression, cold, clammy sweat, persistent vomiting, local tenderness and rigidity.

The symptoms and treatment of other complications are the same as when the diseases occur alone.

Precautions to Prevent the Spread of the Disease.—The nurse should wear a gown and cap. Rubber gloves may be worn, if not the nurse should carefully scrub and disinfect her hands after each treatment. When giving a tub bath

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a rubber apron should be worn. After waiting on the patient the nurse should avoid touching anything with her hands before disinfecting them, and should be particularly careful before going to meals and should avoid touching her face with her hands.

The *patient* should be covered with screens to protect from flies, both for his comfort and to prevent the flies from spreading the infection.

All the *utensils* to be used for the patient—dishes, tray, cutlery, bath tub, thermometer, bedpan, urinal, rectal tubes, etc.—should be carefully marked and isolated. They should be disinfected after use.

All the *bedlinen* and *gowns*, etc., used for the patient must be disinfected.

All *discharges* from the patient, the urine, stools, sputum, vomitus and bath water—must be disinfected. When the patient has involuntary movements, the nurse should be particularly careful in caring for the patient and in the disposal of the stool and linen, etc. Oakum pads are usually used under the patient. The nurse should wear rubber gloves throughout the procedure and in washing the linen even after it has been disinfected. The oakum pad with the stool should be securely wrapped in paper so that even rough handling in the garbage or sewage disposal will not scatter the stool and spread the infection.

After the disease is over the bed, mattress, blankets, linen and utensils, etc., should all be thoroughly disinfected.

Care of the Patient during Convalescence.—Convalescence usually begins in the fourth week, but the danger of heart failure and other complications must be constantly remembered. A recrudescence or relapse may occur in the fifth or sixth week. The diet is carefully regulated, eliminations promoted, and the pulse and temperature are carefully watched. All physical exertion and mental excitement are avoided until the temperature has been normal for at least a week. The same care regarding visitors, reading and conversation, etc., should be observed as during the disease. When the patient is finally allowed up he should be advised to move about slowly and avoid fatigue or mental excitement. Fresh air and sunlight are very important.

See BRAND BATH; INFECTIOUS DISEASES, COURSE OF.

Prophylactic Treatment.—Wonderfully good results have been obtained from the injection of killed bacilli as a prophylactic measure against typhoid fever both in military and civil life. Statistics show a steady decline of typhoid in the U. S. Army since the introduction of compulsory vaccination in 1910. Only one case occurred in 1913 among over 80,000 men. In the British Army the reduction of morbidity

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is estimated at 50 per cent. An excessive dose of infectious material may break down the protection resulting from the action of the vaccine, yet in such cases the severity of the disease will be considerably modified.

In the army 500 million, 1 billion, and 10 billion bacteria are given usually on three successive Saturdays by means of a subcutaneous injection near the insertion of the deltoid muscle. Occasionally a slight local inflammation with a general feeling of malaise develops which disappears within twenty-four to forty-eight hours. Consequently it is customary to give the vaccine in the afternoon so that any reaction which may develop will occur while the individual is in bed. The degree of immunity decreases after two and a half years. It is advisable, however, in cases of constant strain and exposure to revaccinate each year.

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Typhus fever has been known from the beginning of history as *camp*, *jail*, or *hospital fever*. It was one of the plagues of the Middle Ages which, accompanying great wars, devastated Europe many times. The most notable epidemic of recent times occurred in Serbia in 1915, after the retreat of the Austrian army in December, 1914.

Typhus fever is an acute infectious disease, transmitted by infected lice. The period of incubation is from one to two weeks, the onset sudden, being marked by severe headache and chills, often on successive days, and a quickly rising temperature. The chief diagnostic symptom is a mulberry-colored rash which appears about the fifth day on the chest, abdomen and back. The rash spreads rapidly over the entire body, in severe cases, including the face. The rash does not fade upon pressure; the skin is faintly flushed so that the body has a uniform dusky purple appearance.

In addition to the headache there is usually severe pain in the limbs and back. There is always mental confusion or dullness and sometimes severe delirium. The fever lasts two weeks and ends by lysis, leaving the patient greatly prostrated and with little or no change in the mental condition. The rate of mortality is very high among patients who are poorly nourished and who receive little or no nursing.

The first requisite is that the patient should be thoroughly deloused, the clothing steam-sterilized, the body carefully bathed and some form of petroleum applied to the hairy parts. The patient must be kept quiet, free from all outside irritation, his delusions humored, and ice applied to his head. Water must be given regularly, and in large quan-

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tities. There is usually no gastro-intestinal trouble; and food, nourishing and easily digested should be given at regular intervals, the patient being aroused for this purpose if necessary. There should be, of course, the usual care of the bowels. The mouth and teeth require the most unremitting care on account of the tendency to parotid abscesses. Similar attention should be given to the skin. Bathing seems to have little effect on the temperature but it soothes the irritated nerves and helps to keep the skin in good condition. Avoidance of pressure, careful massage towards the heart, and systematic bathing are of very great aid in averting the abscesses and post-typhus gangrene to which severe cases have a tendency. It is sometimes difficult to determine the extent of the delirium, therefore, the patient needs constant watching to avoid an attempt at suicide.

The convalescence is a time of anxiety. The patient should be kept in bed for ten days after the lysis and should be guarded against undue exertion. The mental confusion clears up slowly, sometimes lasts many weeks, and may escape the notice of the nurse.

To reiterate: the outcome in typhus depends largely upon the nursing care. Adequate nursing in typhus demands: thorough delousing, application of cold to the head, the avoidance of noise or bustle, humoring the patient, the forcing of water, the giving of easily-digested nourishing food at regular intervals, exquisite care of the mouth and the skin, and constant watchfulness both before and after lysis.

In Serbia, in 1915, Dr. Richard Strong of Harvard demonstrated a practical and efficient method of stopping epidemics by delousing whole villages and regiments. The people entering one end of a sanitary car were bathed while their clothes were steam-sterilized. At the other end of the car they received their clothes dry and free from vermin. By similar methods, the Baltic Red Cross Commission under Dr. Edward Ryan checked an alarming epidemic in three weeks in Esthonia and have succeeded in preventing subsequent epidemics from entering the Baltic States from Russia by maintaining delousing stations on the border.

(See INFECTIOUS DISEASES, COURSE OF; and TYPHOID FEVER.)

U

ULCER OF STOMACH

See STOMACH.

ULCERS, VARICOSE

See SKIN DISEASES.

UMBILICAL CORD

See LABOR, MANAGEMENT OF.

UREMIA

This is a toxic condition caused by the presence in the blood of constituents which normally are eliminated by the kidneys. These substances when retained in the circulation act deleteriously on the nervous system.

Physical symptoms.—Headache, nausea, vomiting, dyspnea without exertion and often so great that the patient cannot lie down, arrhythmical or Cheyne-Stokes respirations, edema of the extremities, twitching of the muscles and convulsions may indicate this condition. In chronic uremia the skin is very dry and itching and muscular cramps are often severe. The urine may be scanty or suppressed, or it may be increased, and contains albumin.

Mental symptoms.—Vision is often blurred and diminished and hearing is often rendered more acute. The patient may be confused, have illusions and hallucinations of hearing and sight, changeable delusions, and be anxious and depressed. Consciousness may become clouded and restlessness quite marked, and a low muttering delirium may follow, or the patient may become stuporous, pass into coma and die.

See URINE, SUPPRESSION OF.

URETHANE (ETHYL CARBAMATE)

Urethane or ethyl carbamate is a colorless, crystalline powder with a salty taste. It produces sleep in about 15 to 20 minutes, the sleep lasting for about 6 to 8 hours. Its effects are similar to those of paraldehyde, but it is not as reliable. It also increases the secretion of urine.

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It does not upset the stomach, however, and because it is readily dissolved, it may be given hypodermically. Dose, 15 to 60 grains.

URINE

A nurse should note, particularly, the amount of urine voided in twenty-four hours, the amount of each voiding, whether voidings are frequent or not, whether any pain, discomfort or difficulty is felt in passage, and the color, odor, and transparency of the urine.

The Amount.—The normal amount of urine voided by an adult varies from 1000 to 1500 c.c.; by a child (two to fourteen years) from 450 to 1500 c.c. A normal adult voids from 8 to 10 ounces every 4 to 8 hours. Patients should be given the bedpan or urinal at regular hours, usually before meals and before bedtime.

The Transparency of Urine.—Normal urine is always clear and transparent; on standing nothing but a delicate floating cloud is seen in the center.

Normal urine is **acid in reaction** and always contains waste products in the form of phosphates which are held in solution by the acid medium.

The Color of Urine.—The color of urine depends upon the amount and kind of pigment, the concentration of the urine, the amount and kind of solids, decomposition of the solids in it, the presence of abnormal constituents, and the action of various drugs.

The Odor of Urine is said to be characteristic, that is, it is like nothing else—the odor of urine about a patient is unmistakable. It is due to various volatile, aromatic substances in it.

The Collection of Specimens of Urine

A "Routine" Specimen.—A "routine" specimen is the urine passed in one voiding. The whole amount voided may be sent for examination, but only four ounces are necessary for the tests in a routine examination. Food and exercise cause a temporary change in the urine, therefore the best time to collect a routine specimen is before breakfast.

It will be examined for:

I. *Its Reaction*, that is, whether it is acid or alkaline. Normal urine is acid because, on a mixed or average diet, more foods are eaten which yield acid waste products as a result of their metabolism than foods which yield alkaline. The reaction may vary somewhat, therefore, with the diet.

II. *The Specific Gravity*, which depends upon the amount of solids in the urine in proportion to the amount of water. It is based upon water as a standard—one liter of water at a

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certain temperature weighs 1000 grams. Urine is heavier than water, because of the solids contained in it. The specific gravity of normal urine varies from 1.012 to 1.024 for an adult, and for a child from 1.008 to 1.020. In disease it may be as low as 1.002 (showing that the kidneys are eliminating a smaller amount of solid waste in proportion to the amount of water), or it may be as high as 1.060, showing the presence of a large amount of solids.

III. *The Presence of Epithelial Cells and Leucocytes*, or white blood cells. The kidney tubules, which secrete the urine, the ureters and the bladder are lined with epithelial cells. These are being constantly worn out and shed in the urine (just as the cells of the outer skin), so that there will always be a few epithelial cells in the urine. *Many epithelial cells*, however, indicate increased destruction of these cells and so indicates disease of the lining of the kidney tubules, the ureters or the bladder.

IV. *The Presence of Albumen*.—Albumen is a body protein which circulates in the blood to supply the cells and which forms a necessary constituent of all body cells. Normally, in the urine there is a slight or “faint” trace of albumen, but too small an amount to be detected by the ordinary tests used.

Albumen in the urine may result from the following conditions:

1. Acute nephritis, in which the amount of albumen may be so great that when the urine is heated it forms a jelly—albumen coagulates when heated like the white of egg, which is largely albumen.

2. In febrile conditions, as in scarlet fever and diphtheria, etc. Nephritis is one of the dreaded complications to be guarded against in these diseases.

3. Poisoning by ether, bichloride of mercury, carbolic acid, lead and cantharides, etc.

4. An uncompensated or failing heart.

5. In all severe cases of anemia.

6. In pregnancy.—Nurses often do routine examinations in pre-natal cases to detect such signs.

V. *The Presence of Sugar or Glucose*.—Normally there is a very faint trace of sugar in the urine. Eating a large amount of candy may cause temporarily a marked increase of sugar to appear in the urine in a perfectly healthy person. With no such cause, however, the presence of sugar indicates that the patient is suffering from a very serious disease—diabetes. *The presence of sugar in the urine does not indicate disease of the kidneys.*

A Twenty-four-Hour Specimen of Urine.—*Its Value and Importance.*—If the routine specimen of urine on examina-

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tion shows the presence of abnormal constituents or if the disease from which the patient is suffering makes a more thorough examination desirable, *all the urine secreted by the kidneys* during a period of twenty-four hours is measured, saved, and sent to the laboratory for examination. With a specimen of one voiding, it is possible only to make a *qualitative analysis*, that is, to find out what *constituents or wastes* are present, but not a *quantitative analysis*, that is, to find out how much of each waste product is present. With a twenty-four-hour specimen—the total amount secreted by the kidneys—it is possible to estimate not only what wastes the kidneys are eliminating, but the quantity of each and so to form an accurate idea of not only how the kidneys are working, but of how foods are being utilized in the body, and also of other processes of metabolism. Again as the urine is altered by diet and exercise, etc., the only way to obtain accurate results is to examine the full amount voided during the day.

For instance, a twenty-four-hour specimen is collected from 6 A.M. of one morning (or at whatever hour designated) to 6 A.M., that is, exactly the same hour on the following morning. Now the urine voided at 6 A.M. of the first morning has been secreted by the kidneys and collected in the bladder during several previous hours—we do not know how many—and so must not be included in the twenty-four-hour specimen begun at that hour. The patient should void and empty the bladder at 6 A.M. (if that is the time for beginning), and *this urine should be thrown away*. If the bladder is now empty we know that all the urine voided up to and including 6 A.M. of the following morning must have been secreted by the kidneys. For the same reason, to make our collection complete, we must see that the patient voids, and that the bladder is emptied at 6 A.M. of the following morning, because the urine contained in the bladder at that time has been secreted by the kidneys during the period that they are under examination.

Test for Acetone

See DIABETES MELLITUS.

Tests for Albumen

1. *Heat and Acetic Acid Test*.—Fill a test tube two-thirds full of urine. Add about five drops of 2 per cent. acetic acid (enough to make the reaction acid), and boil at the top, holding the tube at the bottom and directing the flame against the upper portion of fluid. Add a few more drops of acid, then examine the tube by transmitted light against a black background for a cloud in the top portion as compared with the portion just below it. If the precipitate is

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flocculent, take the tube in a holder and heat the entire contents to boiling and stand the tube in a rack. When the precipitate has settled, fifteen minutes or more afterward, mark the percentage of albumen according to the estimated proportion of the column of urine occupied by the sediment.

2. *Coagulation of Albumen by Concentrated Nitric Acid.*—Pour about 2 c.c. (one-half dram) of nitric acid into a test tube. Then an equal volume of urine is allowed to flow in slowly so as to form a layer above the heavier acid. A white ring at the junction of the fluids indicates the presence of albumen.

Test for Blood

Guaiac Test.—To about 4 c.c. of urine add 1 c.c. of glacial acetic acid and 2 c.c. of ether; shake gently; pour off the ether, and add a few drops of freshly prepared guaiac tincture and 1 c.c. of hydrogen peroxide. Never use a test tube with yellow copper oxide on its walls resulting from Fehling's or Benedict's sugar test. A blue color indicates the presence of blood.

Test for Diacetic Acid

See DIABETES MELLITUS.

Test for Indican

Mix equal quantities of urine and fresh hydrochloric acid and add drop by drop fresh concentrated solution of chloride of lime (5 to 1000). Indican is indicated by the appearance of a blue color.

Tests for Sugar

See DIABETES MELLITUS.

URINE, RETENTION OF

Retention of urine or failure to void urine may be due to: (1) dulling of the senses so that there is no desire to void, (2) nervous contraction of the urethra, and (3) some obstruction in the urethra or in the neck of the bladder.

In some cases the bladder may become so fully distended that the retention of urine may be accompanied by more or less constant voiding of small amounts of urine.

After operation, occasionally, a patient is unable to void urine voluntarily with the result that the urine collects in the bladder, the organ becoming dilated beyond its usual capacity. Urinary retention is more prone to occur after operations about the rectum, the vagina, the cervix, and the bladder itself than after operations involving the upper abdomen. As a rule, no patient should be allowed to go more than twelve to twenty hours without voiding. However,

URINE, SUPPRESSION OF

every effort should be made to have the patient void voluntarily, because all functions are better performed by nature than if mechanically interfered with.

Treatment.—The treatment of urinary retention is catheterization. A catheterization is a surgical procedure. A surgical procedure in clean cases is an aseptic one, and every bladder which becomes infected after the introduction of the catheter is a horrible reflection upon the individual who has done the catheterization. This procedure should be done with a good light. The urethral orifice is carefully exposed. The catheter, be it rubber, metal, or glass, should be lubricated with a sterile oil, either olive oil or K. Y. While catheterization every eight hours is a routine in some hospitals after perinorrhaphy, it should be remembered that a patient may develop a "catheter habit" because the act of micturition or urination causes slight pain, and catheterization affords instant relief without pain. These cases should be treated firmly but gently and various expedients should be tried to induce voluntary micturition. The drinking of large quantities of water, the sound of running water from turning on a water faucet within hearing distance of the patient, or pouring warm water over the vulva may do much to encourage voluntary micturition.

Catheterization must be done by a nurse with a surgical conscience.

See CATHETERIZATION.

URINE, SUPPRESSION OF

Suppression of urine is the failure of the kidneys to secrete urine. It is usually due to extreme congestion of the kidneys, as in acute nephritis. It also follows some of the more extensive major operations, especially those upon the kidneys or prostate gland.

Treatment.—The prognosis in all these cases is poor. The same methods used by medical men in combating uremia resulting from diseased kidneys are used by the surgeon. If the kidneys are incapable of physiologically performing their function of elimination, then, for the time being, other organs must take over that function. There are many adjuvants—the sweat glands of the skin, and the intestinal canal are invaluable aids. The reflex stimulation of the kidneys by counter-irritants, the forcing of fluids so as to dilute the poison in the blood, the actual removal of some blood with its poisons (phlebotomy), and, finally, operation upon the kidney itself, all help in this very serious complication.

The *skin* may be used to further aid excretion. If the patient will stand it, hot packs should be employed. The purpose of a hot pack is to cause perspiration, and inasmuch

URINE, SUPPRESSION OF

as urea is one of the chief elements of sweat, a partial strain is taken away from the kidneys. Very often this procedure alone will be sufficient to stimulate the kidneys to excrete urine. Hot packs should be repeated at intervals of four to six hours. While the treatment is being administered, the condition of the patient must be carefully watched, for the packing often results in weakness and prostration. The other danger of giving a pack to a surgical patient is that the body must be carefully dried after the treatment in order to prevent post-operative pneumonia. In addition, great care should always be taken that the skin which has already been made sensitive through the application of the ante-operative painting of iodine should not be burned, and further avenues of infection opened through denuded skin.

The use of the *intestinal tract* as an avenue of elimination may be further stimulated by employment of colon irrigations. The colon irrigations not only carry off large amounts of toxins, but they are a means of supplying water to the tissues.

The *kidneys* may be stimulated reflexly by counter-irritants applied to the skin of the lumbar region. This may be accomplished by the use of flaxseed poultices applied at two-hour intervals, or by hot water bottles. Some surgeons employ drugs in order to stimulate the kidneys directly, by the use of such substances as theobromine because of its direct diuretic action. Five to eight grains are given three times a day for the space of three days and then the drug is stopped. There is no doubt that this drug is excellent in stimulating the kidneys and certainly surpasses caffeine in its action. The disadvantage is that it may cause a certain amount of nervousness and insomnia.

Forcing fluids either by protoclysis or hypodermoclysis will cause enough fluid to be absorbed to dilute the blood, thus resulting in a diminution in the degree of toxemia. This simple method not only relieves the patient of an impending uremia, but the kidneys are stimulated by the added amount of fluid.

In cases of high blood pressure with a high blood urea, the actual removal of part of the blood volume will do much to reduce the nitrogen content of the blood, if only for a short period of time. This is done by a *phlebotomy*, or inserting a cannula in a vein in the arm, and permitting the patient to be bled of 250 to 700 c.c. of blood. The amount withdrawn should depend upon the constitution and physique of the patient. Quite often after this procedure, 250 to 500 c.c. of normal saline are introduced intravenously, resulting in further dilution of the toxins.

UTERUS

If, in spite of all these procedures, there is no urine excreted, a rather heroic operative procedure may be resorted to, that of decapsulating the kidneys. This consists of the excision of the capsule from the kidney so that with this restraint removed, the organ may be able to work more efficiently by establishing new vascular relationships with the surrounding tissues, thereby obtaining better nourishment for itself.

UROPHEN

See THEOBROMINE.

UROTROPIN

See HEXAMETHYLENAMINE.

UTERUS

The uterus is a muscular, pear-shaped organ situated in the pelvic cavity between the bladder and the rectum. Its normal position is that of anteversion. The part of the uterus which projects into the cavity of the vagina is known as the cervix. The uterus is lined with mucous membrane; and entering the fundus or body of the uterus are the openings of the Fallopian tubes. The uterus may be the seat of acute inflammations, mal-positions, or new growths, either benign or malignant.

Inflammations of the Uterus

The mucous membrane of the cervix of the uterus may become acutely inflamed due to a variety of causes, especially from an infection by the gonococcus. This condition is known as endocervicitis, and if the inflammation extends further and attacks the mucous lining of the uterus, the process is known as endometritis. The treatment of this condition may be either medical or surgical.

Treatment of Acute Inflammatory Conditions.—In the acute infections, especially those due to a gonorrhea in which there is an associated urethritis (inflammation of the urethra) and a purulent vaginal discharge, it is of the greatest importance to warn the patient of the severe infectiousness of the disease, and the dire results which follow, if it is willfully neglected. It is imperative that the hands be kept away from the eyes, because a gonorrheal infection of the organs of sight may cause total and permanent blindness.

The patient should be placed in bed, given a bland non-irritating diet without condiments or spices, and all alcoholic beverages absolutely forbidden. Fluids should be forced to the utmost, and the attending nurse should give copious vaginal douches every four hours with any silver prepara-

UTERUS

tion, either protargol or argyrol in dilutions of 1:10,000. In more chronic stages, these may be followed by silver nitrate irrigations.

Cervix.—The cervix, as a rule, is treated by the surgeon by direct applications of 10 to 20 per cent. silver nitrate, iodine, or 20 per cent. argyrol. The patient is appropriately draped, placed in the lithotomy position, a bivalve speculum is introduced, and the applications made directly to the cervix. However, in all these treatments, while the cervix itself may be benefited, it is difficult to reach the endometrium or lining mucous membrane of the uterus, and very often more radical surgical procedures have to be resorted to.

Operative Treatment.—One of the most common procedures is the operation known as dilatation of the cervix and curettage of the uterus. The purpose of the dilatation is to insure sufficient stretching of the cervical canal, so that instruments may be freely passed into the uterus, and secondly to insure drainage of the uterine cavity. The object of the curettage is to scrape away the diseased mucous membrane of the uterus so that a new and healthy lining will replace the diseased part. While this operation is done for chronic inflammation, it is also performed for the retained membranes of pregnancy, and for incomplete abortions. It is also a diagnostic measure, for in doubtful cases of cancer of the uterus, the curettings may be examined for microscopic evidences of malignancy.

There are cases in which there is a definite stenosis, or narrowing of the cervix, resulting in very painful menstruation (dysmenorrhea) and often in sterility. In order to insure a permanent opening of the cervical canal, after operative dilatation, a stem-pessary of either glass or rubber is often sewed in the cervical canal, and permitted to remain in place until the appearance of the next period. While the stem-pessary is within the cervix, a daily douche of disinfectant variety should be administered, as the mechanical presence of the foreign body generates a certain amount of disagreeable discharge.

When the cervix is badly torn, the laceration may become a source of irritation. A plastic repair is often done; the operation being known as *trachelorrhaphy*. When the tears are multiple it may be necessary to amputate the cervix partially or completely.

Uterus, Malpositions of

While the normal position is that of anteversion, the uterus may occupy a backward position. This is spoken of as retroversion. Naturally there are many women who

UTERUS

suffer from retroversion without symptoms, but if backache and other reflex symptoms are severe, the uterus must be replaced. The replacement will be dependent upon the movability of the uterus. The uterus may be replaced sometimes by manual manipulations by the surgeon with the patient in the knee-chest position. Should the procedure prove too painful, because of inflammatory products binding the uterus to other structures, hot vaginal douches may be ordered twice daily, after which the patient is instructed to assume the knee-chest position for periods of from five to ten minutes, night and morning. This often diminishes the inflammation to such a degree that manipulations on the part of the doctor are less painful and more successful. After the uterus has been replaced it may be held in position by pessaries. These are appliances, usually of hard rubber, of various forms, which are introduced into the vagina with the object of exerting pressure so as to hold the uterus in place. Pessaries must never be sterilized by boiling because, if they are made of rubber, boiling alters their shape. If the uterus cannot be brought back by these measures, operative procedures must be resorted to.

Operations for Retroversion.—The purpose of all operative procedure is to bring the uterus forward and upward to its normal anatomical position and to hold it securely there. In the majority of operations this is accomplished by shortening the round ligaments. The operation may be performed through the inguinal canals, through the abdomen, and through the vagina.

The inguinal canal route:—As the round ligaments help to maintain the normal position of anteversion, they may be isolated in the inguinal canal, drawn out and sufficiently shortened so as to exert tension, and thus mechanically pull the uterus forward into place.

The abdominal route:—The uterus is lifted from its retroverted position and the fundus is sutured to the anterior abdominal wall directly (ventral fixation). Or the round ligaments are sutured to the recti muscles (the so-called Gilliam operation of ventral suspension).

The vaginal route:—The patient is placed in a lithotomy position, and the operation done through the vagina. The uterus is brought forward by suturing either to the anterior vaginal wall, or the lower part of the bladder, or it is pulled into place by shortening the round ligaments.

Uterus, Prolapse of

This condition is often called “falling of the womb.” Prolapse of the uterus is divided into three degrees. The first degree is that in which there is a relaxation of the pelvic

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floor with a protrusion of the vaginal walls; in the second degree, the cervix is found at the vulva; and in the third degree there is a mass of the uterus protruding from the vagina and lying between the thighs.

Treatment of Prolapse.—The palliative measures are the use of pessaries and tampons. A large circular rubber ring in the vagina is often very efficacious in maintaining the uterus in position. It is highly important that these pessaries be removed at least once a month and cleaned, and at the same time the vaginal canal be inspected to determine whether any irritation is present.

The curative measure is operation. The uterus is brought forward and upward by a ventral fixation and a perineorrhaphy gives support below. In some cases it is often advisable to remove the uterus (hysterectomy).

Uterus, Tumors of

The uterus may be the seat of benign and malignant growths. The most common benign tumor is a fibroid. These may cause bleeding (menorrhagia), vaginal discharge, pain, and quite often a mass may be felt within the abdomen. However, there are many women who have fibroids which never cause symptoms. Fibroids are treated by X-ray, radium, and operation.

Operative Treatment.—If the fibroids are single and do not involve the entire uterus, the tumor may be enucleated (myomectomy). If the tumors are multiple and involve most of the uterus, the entire organ may be removed (hysterectomy). This is an operation designed to remove the uterus. It may be performed through the abdomen (supravaginal hysterectomy), or it may be done through the vagina (vaginal hysterectomy).

Supravaginal Hysterectomy.—After the patient is anesthetized, she is placed in an exaggerated Trendelenburg position. The abdomen is opened by a median incision and the intestines are carefully padded off with warm, moist saline pads. The fundus of the uterus is seized with a vulsellum. The broad ligaments on each side are clamped, and, if possible, one of the ovaries is left. The uterovesical fold of the peritoneum is incised and dissected toward the bladder. The uterine arteries are then clamped and the uterus is amputated through the cervix. The cervical stump is grasped with a second vulsellum, and the cervical canal is cauterized with carbolic acid or iodine. The cervix is then united in interrupted sutures, and the vessels usually tied with plain gut. The round ligaments are sutured to the cervical stump and the two layers of the pelvic peritoneum approximated. This, of course, leaves a little cervical tissue

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which may cause a persistent leucorrhea. To avoid this the entire cervix may be extirpated.

When the pelvic operation has been completed, the patient should be returned to the horizontal position and the abdominal wall closed. Occasionally vaginal drainage is required. This is done before the abdomen is closed by passing a curved clamp into the vagina and pressing against the posterior vaginal wall behind the cervix. The surgeon incises this area and introduces a cigarette drain into the clamp. When this is withdrawn, the drain is pulled down into the vagina.

There is no special nursing required post-operatively except that a careful watch should be kept for hemorrhage. Occasionally, although fortunately rarely, a ligature slips, and a uterine artery will start to bleed. This requires immediate surgical interference. Patients, as a rule, are kept in bed for about sixteen days.

Vaginal Hysterectomy.—This is performed through the vagina without an abdominal incision. It has no advantage over the other except that it does not leave a scar.

Malignant Diseases of the Uterus.—These may either affect the cervix or the body of the uterus. They are usually carcinomatous in character. The treatment is either complete hysterectomy, or the application of radium.

Uterus, Hemorrhage from

The *causes* may be (1) inflammation of the uterus, ovaries or Fallopian tubes; (2) tumors; (3) foreign bodies; (4) displacements; (5) systemic disorders and visceral diseases such as diseases of the heart.

Menorrhagia is a profuse or prolonged menstrual flow.

Metrorrhagia is loss of blood in the intervals between menstruation. Any irregular bleeding from the uterus or unusually profuse menstrual flow, particularly after the age of thirty-five, should be reported to a surgeon without delay. It may possibly be due to carcinoma in which the only hope of cure is in an early diagnosis and surgical interference. If such a condition is brought to the attention of a nurse she should advise that person, without alarming her unnecessarily, to consult a surgeon.

A *post partum hemorrhage* is one occurring after childbirth or a miscarriage.

Treatment.—This depends upon the cause. In all cases the patient should be put to bed and kept very quiet. The buttocks should be elevated and an ice-bag applied to the lower abdomen. Ergot may be given internally. Hot vaginal or intra-uterine douches (118° to 120° F.) are usually given with or without astringents. Vaginal tampons or

UVA URSI

uterine tampons are frequently inserted to check bleeding by pressure. In giving douches or in packing the vagina or uterus everything must be sterile. An intra-uterine douche or packing the uterus are procedures never attempted by a nurse except as a last resort when all other measures have failed and only when impossible to secure the services of a doctor.

UVA URSI (BEAR BERRY)

Uva ursi is obtained from the leaves of the **Arctostaphylos uva ursi**, an evergreen shrub growing in northern Europe and the United States. Its active principles are the glucosides, **arbutin** and **methylarbutin**. It also contains an inactive glucoside ericolin, and small quantities of tannic and gallic acids.

Because of the tannic and gallic acids which it contains, **uva ursi** contracts mucous membranes.

The principal action of **uva ursi**, however, is to increase the flow of urine, by directly increasing the activity of the kidney cells. This effect is due to the **arbutin**. It also acts as an antiseptic on the mucous membrane of the ureter, bladder and urethra.

Preparation

Fluidextract of Uva Ursi; dose 5 to 15 minims.

V

VACCINATION

See SMALLPOX.

VACCINE VIRUS

This is the pus obtained from the pustules of calves suffering with cowpox. The pus is obtained under sterile precautions and a little glycerin is added as a preservative. It is used for vaccination against smallpox.

The principle of vaccination depends on the fact that an individual who has had an attack of cowpox, becomes immune against smallpox. Vaccination produces a mild attack of cowpox at the site of the application of the virus. This makes the patient immune against smallpox.

VACCINES, BACTERIAL

Bacterial vaccines are solutions of dead bacteria in normal salt solution. A $\frac{1}{2}$ per cent. carbolic acid solution is usually added as a preservative.

They are used to immunize patients against infections caused by the same kind of organisms as those that are injected. Vaccines are usually given hypodermically or intramuscularly. There are two kinds of vaccines: Autogenous vaccines and stock vaccines.

Autogenous vaccines are solutions of bacteria, obtained from the patient who is being treated.

Stock vaccines are solutions of bacteria obtained from other sources.

The principle upon which the action of vaccines is based, is the following: The injection of the dead bacteria into the patient, causes the formation, in the serum of the blood, of a substance which excites the phagocytic action (destructive action) of the white blood corpuscles, so that they take up and destroy the bacteria of the blood more readily.

The substances formed in the serum by the dead bacteria, which increase the phagocytic action of the white blood corpuscles, are called opsonins.

VAGINAL IRRIGATION

Preparations

Staphylococcus Vaccine, used in the treatment of acne, furuncles and other Staphylococcus infections.

Streptococcus Vaccine, used in treating Streptococcus infections.

Typhoid Vaccine; it is injected into patients to prevent them from contracting typhoid fever when they are exposed to that disease (immunizing them against typhoid).

Gonococcus Vaccine, is used principally in the treatment of gonorrheal joints.

Bacillus Coli Vaccine.

Pneumococcus Vaccine.

Coley's Serum; this is a mixture of *Bacillus prodigiosus* and Streptococci, which is used in the treatment of sarcoma.

See SERUMS.

VAGINAL IRRIGATION

This procedure consists in injecting into the vaginal canal, with little or no force, a solution of the required temperature.

Vaginal irrigations are used as a therapeutic measure in the following conditions:

1. Inflammation and congestion of the vagina or pelvic viscera.
2. Leucorrhea.
3. Hemorrhage from vagina or uterus.
4. A cleansing irrigation is usually given as a preparation for an operation on the reproductive organs or external genitals.

Contraindications:—

1. Before or during menstruation.
2. During pregnancy to avoid causing contractions of the uterine muscles with the danger of abortion.

The **Purposes** for which they are given are:

1. To cleanse, disinfect or deodorize.—The *solution* used may be plain sterile water, or an antiseptic such as boric acid, lysol, carbolic acid, or silver nitrate, etc.; or a deodorant such as potassium permanganate or formalin. The *temperature* varies from 105° to 112° F.
2. To relieve pain, inflammation and congestion.
3. To stimulate the circulation and promote the absorption of exudates.

Astringents—alum, acetic or tannic acid—are used for inflammation and congestion.

Normal salt solution is sometimes used as a stimulating irrigation. The *temperature* varies from 118° to 120° F.

4. To check bleeding.—Sterile water, boric acid, or as-

VAGINAL IRRIGATION

irrigant solutions are used. The *temperature* varies from 118° to 125° F.

Method of Procedure.—The articles necessary for the treatment are: A douche pan, a douche can with tubing and stopcock attached, a douche nozzle, the solution ordered, at the required temperature, and provision for draping the patient and for drying the parts after the treatment, and a basin for the soiled nozzle. For the routine douche it is not necessary to have the can and tubing sterile, but they must be clean. The douche nozzle, however, must always be sterilized by boiling for five minutes. As glass nozzles are frequently used care must be taken that they do not break or crack. A cracked nozzle must never be used.

These articles are brought to the bedside properly covered.

The Position of the Patient.—The patient should lie in the dorsal recumbent position with the shoulders low (remove at least one pillow) and the hips elevated so that the solution will bathe the cervix and all parts of the vagina. She should also lie perfectly flat in the center of the bed with the douche pan properly and comfortably placed so that there is no danger of the return flow soiling the bed. The pan should not be placed under the patient until the nurse is ready to give the treatment. It should be warm and covered with a pad or pillow for the comfort of the patient. The thighs and knees are flexed and the position made as comfortable as possible.

The gown should be neatly turned back to prevent soiling. In cool weather a blanket will be necessary to cover the chest.

The Insertion of the Nozzle.—Before inserting the nozzle examine it again to see if it is intact. Allow the solution to run through the tubing to warm it. Test the solution by the back of your hand. Cleanse the parts by allowing the solution to run over them. Insert the nozzle gently. In inserting it care should be taken to direct it upward and backward behind the cervix uteri to the farthest limit of the cul-de-sac to avoid the danger of forcing the solution or infected material into the uterine cavity. The nozzle is provided with holes at the side and not at the end so that there is less danger of this taking place. The solution will then flow about the neck of the uterus and circulate through all parts of the vagina, distending and bathing it.

The Duration, Force and Temperature.—The irrigation should be given slowly so that as far as possible the vaginal folds will be distended and the solution reach all parts and remain long enough to have a beneficial effect. Little

VALERIAN

or no force should be used in order to avoid the danger of forcing the solution into the uterine cavity. The can should, therefore, not be more than two or three feet above the patient. Hot irrigations are usually used because they lessen uterine excitability, muscular contractions, and pain. The benefit of the douche is due largely to the heat.

The vagina being insensitive, very hot irrigations may be used without injury to the tissues, but it must be remembered that the perineum and external genitals over which the solution flows are very sensitive and may easily be burned. This may be avoided by applying grease to the part so that the water does not come in contact with the tissue.

Precautions in Infectious Conditions.—When the inflammation is due to infection by the gonococcus care must be taken to avoid contraction of the infection or of carrying it to other patients. The nurse should wear a gown and rubber gloves and should be particularly careful to prevent any discharge being carried to her eyes. Goggles should be worn to prevent the discharge from spurting into the eyes. The utensils should be carefully marked, isolated, and used only for that patient. As there is usually considerable discharge, a basin with an antiseptic solution and sponges may be necessary to cleanse the parts before inserting the nozzle. The sponges should be handled with care and placed immediately in a paper bag to be disposed of.

VALERIAN

Valerian is obtained from the roots and underground stems of the *Valeriana officinalis*, a European plant. Its active principle is a volatile oil which has a very unpleasant odor, especially when it is old. It also contains valerianic acid and other substances.

Valerian has no local action.

When given internally, it produces the following effects:

(1) It has an unpleasant taste and odor, it checks the formation and aids in the expulsion of gas from the stomach (carminative action).

(2) It allays nervousness, and makes the patient calm and quiet; probably because of its unpleasant taste and odor.

(3) It makes the pulse a little faster and stronger.

(4) It is said to increase the sweat and the urine.

Preparations

Fluidextract of Valerian; dose 30 to 60 minims.

Tincture of Valerian; dose 1 to 3 drams.

Ammoniated Tincture of Valerian; dose 1 to 3 drams.

VEGETABLE CATHARTIC PILLS

VAPOR BATH

The method of administering the vapor bath is the same as that of the hot-air bath except that the patient is surrounded by vapor or moist air instead of dry air, so that, if given in bed, extra rubbers will be needed to protect the bed.

Effects of the Vapor Bath.—The effects are the same as those attributed to the hot-air bath, but are very much more intensified, as shown in the following results:

1. The body temperature is increased more rapidly, and to a greater degree.
2. The oxidation of protein is greatly increased, therefore it is useful in gout, rheumatism, etc., when oxidation of protein wastes is incomplete.
3. The pulse is more rapid, blood-pressure lower and the heart quickly tires out.
4. Respirations are also rapid, but not in proportion to the pulse, so that the tissues lack oxygen.
5. Perspiration is more rapid and profuse.

The **vapor bath** is used as a therapeutic measure in the treatment of the same conditions as those mentioned under the hot-air bath.

The *temperature* of the vapor bath varies from 120° to 130° F.

The *duration* of the bath when used as a preparation for a cold bath varies from 3 to 5 minutes and when used to increase eliminations from 15 to 30 minutes.

The principles underlying the procedure and the precautions to be observed are the same as in the hot-air bath, but as the vapor bath is much more vigorous and exhausting, therefore more dangerous, the patient must be watched more closely.

VARICOCELE

See TESTICLE.

VARICOSE ULCERS

See SKIN DISEASES.

VARIOLA

See SMALLPOX.

VARIOLOID

See SMALLPOX.

VEGETABLE CATHARTIC PILLS

See CATHARTIC PILLS.

VENEREAL DISEASES

VENEREAL DISEASES

Syphilis, Gonorrhea and Chancroid constitute a group known as the venereal diseases, concerning which the general public is little informed because of a false sentiment which has banished them from mention until very recent years.

Syphilis

Syphilis is a chronic disease, due, like tuberculosis, to a germ of comparatively slight virulence, but of great staying powers. It does not complete its course in the body rapidly like scarlet fever, diphtheria or even typhoid fever, but remains more or less active for many years.

The syphilis germ is probably of the animal rather than the vegetable kingdom, a protozoön rather than a bacterium. It usually enters the body through a scratch or abrasion of the skin or a mucous membrane. Notwithstanding that it is so constantly spoken of as a venereal disease, very many cases are contracted from ordinary contact—use of the same towels, pipes, drinking glass, etc., although, of course, the majority are venereal. But even the venereal cases are by no means necessarily illicit; at least half of the total cases being innocently acquired, as from husband to wife or vice versa. It is possible, though usually held improbable, that mouth-spray and hands may enter into its transfer exactly as in scarlet fever or diphtheria. Certainly this is possible in those cases where the infecting individual is afflicted with open sores in mouth or nose.

The incubation period of the initial sore or *chancre* is variable, roughly, three weeks. It appears as a firm, hard pimple, enlarges, and typically disappears again, leaving perhaps a scar, often not. Usually nothing further happens for several weeks, when a number of symptoms related to the surface of the body appear, sores in the mouth and on the tongue, sore throat, rashes of various kinds, falling out of the hair, together with bone-pains, anemia, general debility. These tend to disappear in time, especially under treatment, although in neglected cases very terrible conditions may arise.

Two or three years or more later, the third stage, that of tumors, developing under the skin or internally, appears. Often, especially in treated cases, this stage is delayed for almost a lifetime, appearing late and ending miserably an otherwise healthy and successful life.

A fourth development is the *parasyphilitic* stage in which, without actual tumors, a general poisoning of the nervous system occurs, giving rise to many of our aged crippled, both in body and in mind.

VENEREAL DISEASES

It is, like many diseases, transmissible to the child *in utero*, i.e., before it is born. Fortunately many syphilitic parents lose their children by premature birth or in the early months after birth.

The first and second stages of syphilis are infectious. Immunity seems to exist to second infections so long as the first infection is present (tolerance). On complete cure, the disease may be contracted a second time.

Gonorrhea

Gonorrhea has often been described as a "cold" affecting the mucous membranes of the genital tract. Unfortunately, while this description is not a bad one, the implication that the disease is therefore mild and negligible is lamentably false, for the "cold" is usually accompanied by severe symptoms, and complete recovery is rare. As real "head colds" present carriers who, not being immune, infect others, and themselves constantly suffer from recurrences, so also does gonorrhea, but much more frequently. Again, as a "head cold" often extends along the passages connected with the site of the initial trouble, i.e., along the Eustachian tube to the ear, by other openings to the sinuses, or to the pharynx and windpipe or even the lungs, so in gonorrhea extension to connected parts occurs, with resulting complications of many descriptions.

From fifty to eighty per cent. of all major operations on women are traceable to gonorrheal infections, while an immense number of cases of stricture, prostatitis, cystitis, etc., in men are due to the same organism. Blindness in children, the result of infection of the eyes in the very process of birth, is far too common, although the comparative rarity of this disease of the eyes in adults, despite the prevalence of gonorrhea in its ordinary forms, points to a high average of insusceptibility of the eyes, for transfer of gonorrheal infection to the eyes by the hands must be very common, yet gonorrheal ophthalmia is relatively rare.

Gonorrhea has an incubation period of from three days to two weeks, and is probably infectious during this period. The prodromal period is short and indefinite, terminating with the appearance of the discharge. The acute symptoms, pain, fever, etc., last a week or more and in uncomplicated cases tend to lessen, the discharge becoming chronic. Few cases even under the best treatment are completely recovered within six weeks; non-infectiousness is of late years considered a very rare stage, if it is ever reached at all.

Hereditary syphilis and gonorrhea, in the true sense of heredity, are very uncommon. In the sense that they are

VERATRINE

contracted by the child at birth, or before birth from the parents, hereditary syphilis is very common.

Chancroid

Soft chancre or **chancroid** is a comparatively mild affection, usually appearing as a ragged, shallow ulcer, highly infectious but easily controlled by antiseptic treatment. Its chief interest lies in the fact that the syphilis chancre is often present with it and escapes recognition because obscured by the much worse looking and more extensive chancroid.

The modern therapeutic treatment of syphilis has two advantages: one, that it controls the disease in the patient with remarkable power; the second that it quite rapidly makes the patient non-infectious by killing the germ in, or driving it from, the surface lesions. Confusion of mind sometimes leads the patient who is thus rendered non-infectious to believe that he is cured—an unfortunate mistake in all cases.

The control of the venereal diseases consists in finding and isolating the infected persons. It is true that these exist in enormous numbers and carriers not actively sick are, in gonorrhea especially, very common.

Persons in infectious stages of either disease should not be allowed contact with normal individuals, but it is far more important to isolate syphilis than gonorrhea, because carriers of the latter, apart from the sexual act, or the care of children, are not extremely dangerous to others.

VERATRINE

Veratrine is a mixture of all the alkaloids found in **Veratrum sabadilla**, or **Asagræa officinalis**, a Mexican plant known as cevadilla. The most important of these alkaloids are **veratrine** and **cevadine**, which are also found in **veratrum viride**.

It produces the same effects as **veratrum**.

It is used principally to relieve pain in neuralgia, rheumatism, etc.

Preparations

Veratrine Ointment contains 4 per cent. of veratrine.

Oleate of Veratrine contains 2 per cent. of veratrine.

See **VERATRUM**.

VERATRUM (AMERICAN HELLEBORE)

Veratrum is obtained from the root and underground stems of the **Veratrum viride**, or green hellebore, a plant which grows in swampy places in the northern part of the United States.

VERONAL

The active principles of veratrum are the alkaloids, cevadine and veratrine. These alkaloids are very closely related to aconitine chemically, and they produce very similar effects.

The following are the principal effects of veratrum. They resemble those of aconite but they differ in several instances:

1. Locally veratrum is very irritating to the skin and mucous membrane but is soon followed by a local soothing effect. It causes profuse sneezing and coughing when inhaled.
2. It frequently causes nausea and vomiting.
3. It makes the heart beat slower and weaker, by increasing the impulses sent to it through the vagus nerves, thus causing a slow, soft pulse.
4. It lowers the blood pressure.
5. It slightly increases the contraction of muscles but it markedly prolongs the period of relaxation. This is a very characteristic effect of veratrum and is often spoken of as "veratrine effect."

Veratrum is used principally to lower blood pressure in eclampsia, a condition of poisoning occurring in pregnancy.

Preparations

Fluidextract of Veratrum; dose 1 to 5 minims.

Tincture of Veratrum; dose 5 to 15 minims.

See ACONITE.

VERMICIDES

See ANTHELMINTICS.

VERMIFUGES

See ANTHELMINTICS.

VEROFORM

Veroform is a liquid obtained by dissolving formaldehyde gas in a solution of soap. It contains 6 to 20 per cent. formaldehyde gas and is used as a surgical antiseptic.

VERONAL

Veronal, or diethyl barbituric acid, is a white crystalline powder, which has a slightly bitter taste. About fifteen minutes to half an hour after an average dose of veronal is given, the patient usually falls asleep. The sleep resembles the normal sleep, and lasts for five to six hours. On awakening, the patient often complains of headache and dizziness. Occasionally, some patients have peculiar vivid dreams during the sleep. The pulse and breathing are not usually affected by veronal. It is a comparatively safe drug in small doses; but poisonous symptoms (coma, slow pulse and shallow

VESCETTES

breathing) have occasionally followed its indiscriminate use, especially in old people. Veronal is usually given in hot milk, about fifteen minutes to a half an hour before bedtime. Dose 5 to 15 grains.

VESCETTES

Vescettes are effervescent salts compressed into a tablet.

VIBURNUM OPULUS

Viburnum opulus, or cramp root, is obtained from the bark of the Viburnum opulus, a small American tree.

It acts like viburnum prunifolium, but is less soothing to the uterus and is said to relieve colic and cramp-like pains, more than viburnum prunifolium does.

Preparation

Fluidextract of Viburnum Opulus; dose $\frac{1}{2}$ to 4 drams.

VIBURNUM PRUNIFOLIUM

Viburnum is obtained from the root of the Viburnum prunifolium or black haw, a small American plant.

It lessens the contractions of involuntary muscles, especially the muscles of the uterus. It soothes uterine contractions, and is said to check colic and cramps.

It is used principally to relieve painful or excessive menstruation, and to relieve the pains of ovarian disease.

Preparation

Fluidextract of Viburnum Prunifolium; dose $\frac{1}{2}$ to 4 drams.

VIENNA PASTE

See ALKALIES.

VINCENT'S ANGINA

See PHARYNX.

VINEGAR

See ACETIC ACID, DILUTE.

VINEGARS

Vinegars are medicinal substances dissolved in a weak solution of acetic acid, or vinegar.

VITRIOL

See SULPHURIC ACID.

VOCAL CORDS

See LARYNX.

VOMITING

See STOMACH; PERNICIOUS VOMITING (POST-OPERATIVE).

W

WARBURG'S TINCTURE

See QUININE.

WASSERMANN REACTION

The **diagnosis** of the syphilitic diseases of the central nervous system has been much simplified by the Wassermann blood test and the analysis of the spinal fluid. **The Wassermann reaction**, or test, is a complex biological reaction which depends on the fact that the blood of men and animals acquires the power to destroy certain substances, bacteria, etc., when these are present in the body for some time or when they are introduced into it repeatedly in small quantities. This test confirms the diagnosis when the symptoms point to syphilis, and helps to make positive the diagnosis in doubtful cases. To carry out this test the following substances are required: The blood serum of the patient which has been heated and cooled, the blood serum from a normal guinea pig, a watery extract of syphilitic tissue which contains the microorganisms in large numbers, a definite number of red blood corpuscles from a normal sheep and the blood serum from a rabbit into whose body red blood corpuscles from a sheep have been injected at repeated intervals, which has been heated and later cooled. The various substances are placed in a test tube in definite quantities and order and the mixture is placed in an incubator for definite periods. When a patient has had syphilis and there are substances in his blood which tend to destroy the syphilitic organism, *treponema pallidum*, no change takes place in the opaque appearance of this red mixture of blood serum, corpuscles, etc. This is said to be a strongly positive reaction, or in the terms of the laboratory it is "four plus," and indicates that the disease is not cured. If, however, the patient never has had syphilis, the mixture loses its opaque appearance and becomes clear, and the reaction is said to be negative. When the change is slight, or when the mixture

WEIGHTS AND MEASURES

becomes only partly clear, or almost clear with only slight cloudiness, it is said to be three plus, two plus or one plus.

This test is also made with the spinal fluid, for in tabes dorsalis and the cerebral forms of syphilis the spinal fluid often gives a positive reaction when the blood does not.

The microscopic examination of the spinal fluid usually shows an increase in the number of white blood corpuscles.

The blood for the Wassermann test is obtained from the veins of the arm. The skin is thoroughly cleansed with soap and water and dried with alcohol. It is further prepared by the application of tincture of iodine. Other preparations are to boil the syringe and needles, have ready a sterile test tube to receive the blood, a tourniquet to apply to the arm and a sterile dressing to apply when the needle is withdrawn.

WEIGHTS AND MEASURES

The Metric System

The elementary unit of measurement in the metric system is the one for length. This is the **meter**, which is about one ten-millionth part of the distance from the equator to the north pole. It is equal to about 39.37 inches and is written as 1.0 m.

Table of Length.—The unit is 1.0 one meter.

One-tenth of the meter is 0.1, one decimeter.

One-tenth of the decimeter is 0.01, one centimeter.

One-tenth of the centimeter is 0.001, one millimeter.

Table of Volume.—The volume of a substance is the amount of space which it occupies.

A quantity of space one meter long, one meter wide and one meter high, is **one cubic meter**, which is the unit of volume.

This is divided into a thousand **cubic decimeters**, each of which is again divided into a thousand **cubic centimeters** and this in turn into a thousand **cubic millimeters**.

Table of Capacity.—In measuring fluids, we measure the quantity of fluid contained in a given space. The space which the fluid occupies varies with its character and temperature; thus an oily substance will occupy less space than boiling water. We therefore take the space occupied by water at 4° Centigrade as the standard.

The unit of capacity is the **liter**, which is the amount of water contained in a volume of one cubic decimeter.

The liter is divided into **deciliters**, **centiliters** and **milliliters**. The deciliter is a tenth, the centiliter a hundredth, and the milliliter a thousandth part of the liter. *Since the liter occupies one cubic decimeter of space, the milliliter will occupy one thousandth part of that, and is therefore equivalent to the cubic centimeter.*

WEIGHTS AND MEASURES

The new Pharmacopeia has adopted the term **mil**, the abbreviation for milliliter, instead of c.c. (cubic centimeter). For example, 50.0 c.c. are now written 50.0 mils, 0.3 c.c. as 0.3 mil, etc.

Table of Weight.—Solid substances are usually measured by weight.

The unit for measuring weight is the **gramme**; which is the weight of one cubic centimeter of water at a temperature of 4° Centigrade, written:

1.0 gm., one gramme.

One-tenth of the gramme is 0.1 gm., one decigramme.

One-hundredth of the gramme is 0.01 gm., one centigramme.

One-thousandth of the gramme is 0.001 gm., one milligramme.

Units greater than one gramme are given definite names, thus:

10.0 gms. = 1 dekagramme

100.0 gms. = 1 hectogramme

1000.0 gms. = 1 kilogramme

Since 1.0 (one gramme) is the weight of 1 mil or 1 cubic centimeter of water, in expressing the quantities of fluids, which are measured by capacity, the denomination 1.0 means one mil or one cubic centimeter, 2.0, two mils or two cubic centimeters (2 c.c.), etc.

Apothecaries' System

Table of Weight (Measurement of Solids).—The unit of measurement is the **grain**, which is equal to 0.065 gm. (sixty-five milligrammes) in the metric system. The grain is written thus: gr. i.

20 grains = 1 scruple (℥)

3 scruples or 60 grains = 1 dram (ʒ)

480 grains or 8 drams = 1 ounce (℥)

5760 grains or 12 ounces = 1 pound (lb.)

Table of Capacity (Fluid Measurement).—The unit of measurement is the **minim**, which is equal to 0.065 c.c. It is written m. i.

60 minims = 1 fluid dram (ʒ)

8 fluid drams = 1 ounce (℥)

16 ounces = 1 pint (O)

2 pints = 1 quart (qt.)

4 quarts or 8 pints = 1 gallon (gal.)

WET NURSE

Table of Equivalents

Value of Metric Units in Apothecaries' Units

	<i>Grain</i>	<i>Dram</i>	<i>Ounce</i>	<i>Pound</i>
One milligramme.....	0.01543	0.00026	.....	.....
One centigramme....	0.15432	0.0026	0.00032	.....
One decigramme.....	1.54324	0.0257	0.0032	0.00027
One gramme.....	15.43236	0.257	0.03215	0.00270
One kilogramme.....	15432.3564	257.206	32.1508	2.6792

Approximate Equivalents of Metric Units

Weight

One milligramme	0.001 gm = 1/64 of a grain
One centigramme	0.01 gm. = 1/6 of a grain
One decigramme	0.1 gm. = 1½ grains
One gramme	1.0 gm. = 15½ grains (in prescriptions 15 grains)
One kilogramme	1000.0 gm. = 32 ounces or 2½ lbs.

Capacity

One cubic centimeter,	1.0 c.c. = 15 minims
One liter, 1000.0 c.c.	= 32 oz. or 2 pts. (approx- imately one qt.)

Approximate Equivalents of Apothecaries' Units

Weight

One grain =	0.065 gm. (65 milligrammes)
One dram =	4.0 gm. (4 grammes)
One ounce =	30.0 gm. (30 grammes)

Capacity

One minim =	0.065 c.c.
One dram =	4.0 c.c. (4 cubic centimeters)
One ounce =	30.0 c.c. (30 cubic centimeters)
One pint =	500.0 c.c. (500 cubic centimeters)
One quart =	1000.0 c.c. (one liter)

WET NURSE

See INFANT FEEDING.

WHISKEY

See ALCOHOL.

WHITE LEG

See PHLEGMASIA ALBA DOLENS.

WHITE WASH

See CALCIUM.

WITCH HAZEL

WHOOPING COUGH

Nursing Care.—Much attention must be given to keeping up nourishment. When vomiting occurs with attacks of whooping give nourishment in small amounts frequently. If the patient vomits, feed again soon in the hope that this will be retained. An abdominal binder may be used to relieve strain.

Patients need plenty of fresh air. If possible have the crib or bed on the porch. Keep the patient sufficiently warm, as pneumonia is a frequent and often fatal complication.

The patient should be isolated from other children; but the disease is not thought communicable after six weeks, although the patient may whoop for from four to six months.

WIDAL REACTION

If the serum of a patient suffering from typhoid fever is added to an emulsion of typhoid bacilli, and the mixture placed in the incubator for a short period, the bacteria which were formerly scattered throughout the fluid will be found to have clumped together in small masses at the sides of the test tube, and as they gradually fall to the bottom the fluid becomes clear. If a hanging drop preparation is made it will be observed that with the addition of serum the bacilli move closer together, gradually losing their motility, until finally they adhere in clumps.

Serum may be obtained by pricking the finger or ear lobe with a sharp-pointed instrument or needle and allowing the blood to pass into a Wright's capillary tube. Whole blood may be used, in which case one or two drops are placed on a slide and dried and later brought into solution again by the addition of salt solution.

In typhoid fever a positive agglutination reaction may be given as early as the third day of the disease; ordinarily it does not appear before the seventh or eighth day. Occasionally the reaction may be absent or occur only during convalescence; as a rule it is strongest during convalescence, remains positive several weeks and then disappears.

See TYPHOID FEVER.

WINES

Wines are preparations of drugs dissolved in wine. They are made like the tinctures but have a better flavor.

See ALCOHOL.

WITCH HAZEL

See HAMAMELIS.

WINTERGREEN

WINTERGREEN

See SALICYLIC ACID.

WOOD ALCOHOL

Wood Alcohol is made by the destructive distillation of wood. It is very inflammable, and because it is cheap it is used as a solvent for various substances.

Wood alcohol is not used in medicine but it is of great interest because of its poisonous effects. These result from the fact that it is frequently substituted by unscrupulous manufacturers for ordinary alcohol in the manufacture of essences such as soda water flavors, Jamaica ginger, witch hazel, bay rum, cologne, etc. Many patent medicines contain wood alcohol. Since the advent of prohibition cases of wood alcohol poisoning have greatly increased because many beverages are prepared with wood alcohol since it is so difficult to obtain ordinary alcohol.

Wood Alcohol Poisoning

There are two forms of wood alcohol poisoning: the acute poisoning and the chronic poisoning. The acute symptoms follow the drinking of intoxicating or other liquors containing wood alcohol. The chronic symptoms result from the continued use of local applications containing wood alcohol.

Acute Wood Alcohol Poisoning

Symptoms.—The symptoms are due to the fact that wood alcohol is not oxidized in the body as is ordinary alcohol, but affects principally the brain and nerves.

The symptoms begin like an ordinary alcoholic intoxication with excitement and exhilaration. This is followed by: Nausea, vomiting, dizziness, headache, dilated pupils, and delirium. Persistent coma and death may occur within a few hours or a few days. The patient may recover from the acute symptoms but may go blind just the same from destruction of the optic nerve (optic neuritis). Blindness has resulted from as little as five teaspoonfuls; and death has resulted from a half a pint of wood alcohol.

Treatment.—1. Wash out the stomach.

2. Pour hot and cold water over the patient alternately.
3. Give artificial respiration.
4. Strychnine, caffeine and other stimulants are given.

Chronic Wood Alcohol Poisoning

Prolonged use of wood alcohol may cause blindness from destruction of the optic nerve (optic nerve atrophy). This may occur from its internal use or from external applications of various toilet preparations.

WOUNDS

WOOD-TICKS

See LICE.

WORMS

See ANTHELMINTICS.

WOUNDS

Accidental wounds may be incised, stab, punctured, lacerated, contused, or poisoned wounds.

Incised wounds are caused by a sharp, cutting instrument, such as a razor, which severs the tissues causing them to gape open.

Stab wounds are caused by a sharp, cutting, pointed instrument, such as a dagger or knife.

Punctured wounds are made by a sharp, narrow, pointed instrument, such as a needle, splinter of wood or a nail. A rusty nail is more dangerous because being rough it injures the tissues more and also holds more dirt and bacteria.

Gunshot wounds are also punctured wounds.

A contused wound is made by a blunt instrument. The skin is ruptured, crushed or split and the tissues around are bruised.

A lacerated wound is one in which the tissues are torn apart—the edges are roughened and jagged and there is more or less contusion around it. Examples are, the bite of an animal, torn knuckles caused by striking the mouth and teeth, a hook drawn through the tissues, and wounds caused by machinery.

Poisoned wounds may be caused by the bites of poisonous snakes or spiders, a “mad” dog, and insect bites and stings.

Dangerous Effects of Accidental Wounds.—(1) Deeper structure such as tendons, muscles, nerves and large blood vessels may be injured, especially in incised and stab wounds.

2. Hemorrhage is apt to be severe especially in incised and stab wounds. In punctured wounds the hemorrhage may be slight because the blood vessels are pushed ahead or aside. In a lacerated wound also, the blood clots more easily in the roughened irregular tissue and torn vessels tend to contract so are not so apt to bleed.

3. Shock may be severe, especially in wounds to the chest, abdomen, skull or large blood vessels.

4. Infection by pyogenic organisms or the tetanus bacillus may occur from dirt, clothing, powder, or other foreign body carried into the wound. (Slight wounds, even a pin-prick, are often the most serious because so apt to be neglected.) Foreign bodies always help bacteria to gain a foothold. Infection is more apt to occur in the old or in otherwise weakened individuals.

WYETH'S PINS

Treatment of Wounds.—The first-aid treatment is to stop bleeding, relieve or prevent shock, keep the wound clean and absolutely at rest. If available, iodine and a sterile dressing should be applied and, if severe, a splint or sling to keep the part at rest. Expert treatment by a surgeon should be obtained as soon as possible, especially in wounds about the face to avoid deformity from scar formation.

See DAKIN'S SOLUTION.

WYETH'S PINS

See AMPUTATIONS.

X

XEROFORM

Xeroform is a bismuth preparation, and is used principally as an antiseptic dressing in ulcers of the leg, eczema, and as an intestinal antiseptic. Dose 15 to 45 grains.

Y

YELLOW FEVER

See MOSQUITOES.

YELLOW WASH

See MERCURY.

YOUNG'S RULE FOR DOSAGE

See DOSAGE.

Z

ZEA (CORNSILK)

Zea is obtained from the silky threads of the **Zea mays**, Indian corn or maize.

Zea increases the flow of urine and acts as an antiseptic on the mucous membranes of the ureter, bladder and urethra.

Preparation

Fluidextract of Zea; dose 1 to 2 drams.

ZINC

Zinc is a metal which forms salts, many of which are used in medicine.

Chronic Zinc Poisoning

Chronic zinc poisoning occasionally occurs among workers who handle zinc. It causes symptoms like those of lead poisoning.

Uses

Zinc sulphate is used to produce vomiting. The other zinc salts are used as astringents in various skin diseases and ulcers.

Preparations

Zinc Sulphate (as an emetic); dose 5 to 30 grains.

It is used as an eye wash in $\frac{1}{4}$ to $\frac{1}{2}$ per cent. solutions and as an injection in gonorrhea in 1 to 4 per cent. solutions.

Zinc Oxide; dose 2 to 8 grains.

Zinc Oxide Ointment.

This contains 1 part of zinc oxide to 4 parts of benzoinated lard.

Precipitated Zinc Carbonate; dose 2 to 8 grains.

Zinc Stearate.

This is used as a dusting powder on ulcers, and on various skin diseases.

Zinc Acetate.

This is used for injections and douches, in gonorrhea.

Zinc Chloride.

This is a white powder which is moulded into pencils.

ZINGIBER

It absorbs moisture from the air. It is used to destroy tissues (caustic action). It is an ingredient of many "cancer cures," and is applied as an ointment to destroy the cancerous tissue.

Solution of Zinc Chloride.

This contains about 36 per cent. of zinc chloride, and is used as a disinfectant for sinks and toilets.

Burnett's disinfecting fluid.

This contains zinc chloride.

Zinc Iodide; dose 1 to 2 grains.

It is used locally as a caustic and to increase the growth of tissue.

Zinc Valerate; dose 1 to 2 grains.

Zinc Bromide; dose 1 to 2 grains.

This is used to lessen nervousness and the twitchings of chorea and epilepsy.

ZINGIBER

See GINGER.

ZOOLAK

See MATZOON.

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